PART - II
B.Com.

B.Com.

Restructure course of
B.Com. I Year General (T.M. & E.M.)

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
101.	Financial Accounting	6	30	70
102.	Business Economics	4	-	100
103.	Business Organization & Management	5	30	70
104.	Fundamentals of Information Technology	5	30	70

B.Com. I Year Computer Applications

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
101.	Financial Accounting	6	30	70
102.	Programming Concepts Using 'C'	4	30	70
103.	Business Organization & Management	5	30	70
104.	Fundamentals of Information Technology	5	30	70

B.Com. II Year (Regular & Restructures Courses) - New General (T.M. & EM.)

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
201.	Advanced Accounting	6(5+1)	30	70
202.	Business Statistics	5(5+1)	30	70
203.	Financial Services - Banking & Insurance	5	30	70
204.	Taxation	4	30	70

B.Com. II Year Computer Applications

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
201.	Electronic Commerce	5(3+2)	30	70
202.	Business Statistics	5(4+1)	30	70
203.	Taxation	4	30	70
204.	Business Data Processing System	5	30	70

B.Com. III Year (Regular & Restructures Courses) - New General (T.M. & EM.)

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
301.	Business Laws	5(4+1)	30	70
302.	Corporate Accounting	5(4+1)	30	70
303.	Cost & Management Accounting	5(4+1)	30	70
304.	Auditing	5(4+1)	30	70
305.	Business Communication	5	-	100
306.	Advanced Corporate Accounting	5	30	70
307.	Advanced Management Accounting	5	-	100

B.Com. III Year Computer Applications

Part - II	Subjects / Papers	No.of. Hours per Week	Practi-cals	Theory
301.	Business Laws	5(4+1)	30	70
302.	Corporate Accounting	5(4+1)	30	70
303.	Cost & Management Accounting	5(4+1)	30	70
304.	Auditing	5(4+1)	30	70
305.	Business Communication	5	-	100
306.	Web Programming	5(3+2)	30	70
307.	Relational Database Management Systems	5(3+2)	30	70

B.Com. FIRST YEAR

FINANCIAL ACCOUNTING

Paper : 101   Max. Marks : 70+30
PPW : 6 hours

Objectives:

1. To make the students acquire the conceptual knowledge of accounting
2. To equip the students with the knowledge of accounting process and preparation of final accounts
3. To develop the skills of recording financial transactions and preparation of reports using computers

UNIT - I : Introduction to Accounting:

Need for Accounting - definition, features, objectives, functions, systems and bases and scope of accounting - Book keeping and Accounting— Branches of Accounting - Advantages and limitations- basic terminology used- -Accounting concepts and conventions.

Accounting Process-Accounting cycle-Accounting equation- classification of accounts-rules of double, entry book keeping - identification of financial transactions- Journalizing -Posting to Ledgers, Balancing of Ledger Accounts -- Computerized Accounting: Meaning and Features-Advantages and disadvantages of computerized Accounting Creating of an Organization -Grouping of accounts - Creation of Accounts - creation of inventory-creation of stock groups-, stock categories, units of measurement-stock items- entering of financial transactions-types of vouchers-voucher entry- editing and deleting of-vouchers-voucher numbering-customization of vouchers

UNIT - II: Subsidiary Books and Bank Reconciliation Statement

Sub Division of Journal-Preparation of Subsidiary Books including different types of cashbooks- simple cashbook, cashbook with cash and discount columns, cashbook with cash, discount and. bank columns, cashbook with cash and bank columns and petty cash book. Preparation of sales register, purchase register, journal proper, debit note register, credit note register, and different cash books including interest and discount transactions using computers.

Bank Reconciliation Statement- Need - Reasons for difference 'between cash book and pass book balances - problems on favourable and over draft balances - Ascertainment of correct cash book balance. Preparation of bank reconciliation statement using computers.

UNIT - III : Trial Balance, Final Accounts; Errors and Rectification

Trial Balance: meaning, objectives, methods of preparation - Final Accounts; Meaning, features, uses and preparation of Manufacturing, Trading Account, Profit & Loss Account and Balance Sheet-Adjusting and Closing entries. Preparation of trial balance, trading, profit and loss account, processing of year ending and closing the books, adjusting and closing entries and balance sheet using computers

Errors and their Rectification - Types of Errors - Rectification before and after preparation of final Accounts - Suspense Account- Effect of Errors on Profit. Rectification of errors using computers.

Unit - IV : Consignment and Joint Ventures :

Consignment – Features, Terms used Proforma invoice – Account sale – Delcredere commission – Accounting treatment in the books of the consignor and the consignee – Valuation of consignment stock – Normal and abnormal Loss – Invoice of goods at a price higher than the cost price.

Joint ventures – features – difference between joint ventures and consignment, Accounting Procedure – Methods of keeping records for Joint venture accounts – method of recording in co ventures books-separate set of books method.

Unit - V : Depreciation – Provisions and Reserves :

Meaning of Depreciation – Causes – objects of providing for depreciation – Factors affecting depreciation – Accounting Treatment – Methods of providing depreciation – Straight line method – Diminishing Balance Method.

Provisions and Reserves – Reserve Fund – Different Types of Provisions and Reserves.

Suggested Readings:

1. R.L. Gupta & V.K. Gupta : Principles and Practice of Accounting, Sulthan Chand & Sons
2. S.P. Jain & K.L. Narang : Accountancy – I, Kalyani Publishers

3. Tulasian : Accountancy – I, Tata Mcgraw Hill Co

4. Dr. V.K. Goyal : Financial Accounting, Excel Books

5. T.S. Grewal : Introduction to Accountancy, S. Chand and Co

6. Haneef and Mukherjee : Accountancy – I, Tata Mcgraw Hill Co

7. Arulanandam : Advanced Accountancy, Himalaya Publishers

8. S.N. Maheshwari & V.L. Maheswari : Advanced Accountancy-I, Vikash Publishing Co.

9. Ashok Benerjee : Financial Accounting, Excel

10. Warren : Financial Accounting, Cengage

BUSINESS ECONOMICS

Paper : 102   Max. Marks : 100
PPW : 4 hours

Objectives :

To facilitate the students to learn the concepts of economics and apply them in real life situations.

UNIT - I : Introduction

Economic and Non-Economic Activities — Business-Meaning — Economics-Definitions—micro and macro economics-method of economics-positive and normative—inductive and deductive approaches—reading of graphs-concept of slope—Utility-cardinal and ordinal utility-Law of diminishing marginal utility-Law of Equi-marginal Utility.

UNIT - II : Demand, Supply and Market Equilibrium

Demand-meaning-individual demand—law of demand-properties of demand curve-income effect and substitution effect-exceptions to the law of demand—individual demand and Market Demand—demand function—determinants of demand and market demand—shift of demand vs. movement along a demand curve—Elasticity of demand-price elasticity-meaning and measurement-price elasticity and total revenue of a firm-income elasticity-classification of goods based on income elasticity-cross elasticity-classification of goods into substitutes and complements—Supply-law of supply- determinants of supply—market equilibrium—concept of consumer surplus.

UNIT - III : Production and Costs

Production function—Distinction between short-run and long-run—Production with one variable input-relationship between total, marginal and average production functions-law of variable proportion—production with two variable inputs-isoquants-isocosts-techniques of maximization of output, minimization of cost and maximization of profit-scale of production-economies and diseconomies of scale—Cost of production-cost function—short-run total and average costs—long-run total and average cost.

UNIT - IV : Market Structure and Factors of Production

Market structure—characteristics—perfect competition-characteristics-equilibrium price—profit maximizing output in the short and long-run—Monopoly-characteristics-profit maximizing output in the short and long run-defects of monopoly—monopolistic competition-characteristics—product differentiation-profit maximizing price and output in the short and long-run—Oligopoly-characteristics-price rigidity-the kinked demand curve——Factors of Production.

UNIT - V : National Income, Trade Cycles and International Trade

National Income—definition-measurement—GDP-meaning—fiscal deficit—economic systems-socialism-mixed economy system-free market economies- Concepts of Economic Liberalisation, privatization, Globalisation—WTO—objectives—agreements—functions—Trade cycles-meaning-phases-consequences-remedies—International Trade-Balance of payments.

Suggested Books :

Aryasri and Murthy : Business Economics, Tata Mcgraw Hill

Deepashree : General Economics, Tata Mcgrawhill

HL Ahuja : Business Economics, S. Chand

KPM Sundaram : Micro Economics

Mankiw : Principles of Economics,Cengage

Mithani : Fundamentals of Business Economics, Himalaya

BUSINESS ORGANIZATION AND MANAGEMENT

Paper : 103   Max. Marks : 70+30
PPW : 5 hours

Objective :

To facilitate the students to learn the concepts of business organization and management.

UNIT - I : Fundamental Concepts:

Concepts of business, trade, industry and commerce- Business — features of business, Trade - Classification- Aids to Trade - Industry- Classification - Commerce-Relationship between trade, industry and commerce- Business Organization-Concept- -Functions of Business,

Entrepreneur — Meaning-Characteristics of Entrepreneurs - Types of Entrepreneurs -Functions of an entrepreneur - Steps to start Enterprise- Sources of finance -Long Term-Short Term

Lab Work: The students are expected to go through project reports.

Unit-II : Forms of Organization, Sole Proprietorship, Partnership and Joint Hindu Family:

Business Organization - Forms of Business Organization - Classification - Factors influencing the choice of suitable form of organization.

Sole Proprietorship -Meaning -Characteristics - Advantages and disadvantages - suitability.

Partnership - Meaning -Characteristics -Kinds of partners- Registration of partnership - Partnership deed - Rights and obligations of partners - Joint Hindu Family Business - Characteristics — Advantages and limitations.

Lab Work: The students are expected to go through partnership deed and prepare a simple partnership deed.

Unit-III : Joint Stock Company :

Joint Stock Company - Meaning - Characteristics -Advantages - Kinds of Companies -Difference between private and public companies -Promotion of A Company: Promotion-Stages-Promoters

-Characteristics -Registration -Capital subscription -Commencement of Business - Preparation of Important documents-Memorandum of Association - Significance - Clauses - Articles of Association - Contents — Prospectus-Contents-Statement in lieu of Prospectus.

Lab Work: The students are expected to go through a memorandum of association, articles of association and prospectus. As a group they are expected to prepare a model prospectus.

Unit - IV : Management, Planning and Decision Making

Management- Meaning - Significance- Management Vs Administration - Functions of management - Levels of Management - Skills of management -Leadership-Leader Vs Manager-Traits of successful Leaders- Scientific Management - features- Fayol's Principles of Management .

Planning – Meaning – Significance – Types of Plans – Decision making – Steps in Process Decision making process

Lab Work : The students are expected to prepare a small note of the skills of management required to manage the organization of their choice.

Unit - V : Organizing

Organizing – meaning – Organization – Features – the process of organization – principles of organization-Elements of organizations-organization chart

Delegation of authority – meaning – Elements – Principles – Types – Difficulties in delegation – Guidelines for making delegation effective

Centralization – Decentralization – Meaning – Differences between delegating and decentralization

Lab Work : The students are expected to go through the organization structures of a few organizations and prepare an organization structure for a small unit.

The students are expected to prepare a small project report on how to start a small industry unit of their choice incorporating various aspects learned in this subject.

Suggested Books :
1.   Batia RC : Business Organization and Management, Ane Books
2.   Talloo : Business Organisation and Management. Tata

3. RK Sharma and Shashi K. Gupta : Industrial Organization and Management, Kalyani.
4. CB Gupta : Industrial Organization and Management
5. Aryasri and Murthy : Industrial Organization and Management, Tata
6. Govindarajan and Natarajan : Principles of Management, Prentice Hall
7. RK Sharma and Shashi K. Gupta : Industrial Organization and Management, Kalyani
8. CB Gupta : Industrial Organization and Management, Sultan Chand
9. Bhushan YK : Business Organization and Management, Sultan Chand
10. Surendar and Madhavi : Industrial Organization and Management, Himalaya
11. Sherlekar : Business Organization and Management, Himalaya
12. Robins SP : Management, PHI
13. Rao VSP : Management, Excel
14. Gupta CB : Entrepreneurship Development in India, Sultan Chand
15. Prasad LM : Management , Sultan Chand
16. Subba Rao P : Management and Organization Behavior, Himalaya
16. Dubrin : Essentials of Management, Cengage
17. Satyaraju : Management, PHI
18. Moshal : Organization and Management, Galgotia
19. Kumkum Mukhrjee : Principles of Management, Tata
20. Chandra Bose : Principles of Management, PHI
21. James F. Stoneir : Management, PHI

FUNDAMENTALS OF INFORMATION TECHONOLOGY

Paper : 104   Max. Marks : 70+30
PPW : 5 hours

Objective:

To impart basic knowledge about computer with application of various packages.

UNIT - I :

Introduction to computers : Definition, Characteristics and limitations of computers - Elements of Computers - Hardware - CPU - Primary and Secondary memory - Input and Output devices. IT enabled services - BPO, KPO, Call centers.

Modern communications : (Concepts only)- communications — FAX, Voice mail, and information services - E Mail - Creation of

email id - group communication -Tele conferencing - Video conferencing - File exchange - Bandwidth - Modem -Network Topologies - Network types LAN, MAN, WAN and their architecture - Dial up access

UNIT - II :

Operating System and Windows : Operating Systems: Meaning, Definition, Functions and Types of Operating Systems - Booting process - Disk Operating System: Internal and External Commands - Wild Card Characters - Computer Virus, Cryptology. Windows operating system - Desktop, Start menu, Control panel, Windows accessories.

UNIT - III:

MS Office I : MS Word : Word Processing : Meaning and features of word processing - Advantages and applications of word processing - Parts of MS Word application window - Toolbars - Creating, Saving and closing a document - Opening and editing a document - Moving and copying text - Text and paragraph formatting, applying Bullets and Numbering - Find and Replace - Insertion of Objects, Date and Time, Headers, Footers and Page Breaks - Auto Correct - Spelling and Grammar checking - Graphics, Templates and wizards - Mail Merge : Meaning, purpose and advantages - creating merged letters, mailing labels, envelops and catalogs-Working with Tables - Format Painter.

MS EXCEL : Features of MS Excel - Spread sheet / worksheet, workbook, cell, cell pointer, cell address etc., - Parts of MS Excel window - Saving, Opening and Closing workbook - Insertion and deletion of worksheet - Entering and Editing data in worksheet - cell range - Formatting - Auto Fill -Formulas and its advantages - References : Relative, absolute and mixed - Functions: Meaning and Advantages of functions, different types of functions available in Excel - Templates -Charts -Graphs - Macros : Meaning and Advantages of macros, creation, editing and deletion of macros - Data Sorting, Filtering, validation, Consolidation, Grouping, Pivot Table and Pivot Chart Reports.

UNIT-IV:

MS Office II : MS Access - Data, Information, Database, File, Record, Fields-Features, advantages and limitations of MS Access - Application of MS Access -parts of MS Access window - Tables, Forms, Queries and Reports - Data validity checks - (Theory with simple problems)

MS PowerPoint: Features, advantages and application of Ms Power point - Parts of MS Power point window - Menus and Tool bars - Creating presentations through Auto content wizard, Templates and manually - slide show - saving, opening and. closing a Presentation - Inserting, editing and deleting slides -Types of slides -Slide Views- Formatting -Insertion of Objects and Charts in slides- Custom Animation and Transition.

Multimedia : Meaning,   purpose, Usage and application - Images, Graphics, sounds and music - Video presentation devices - Multimedia on web.

UNIT - V : Internet & E-commerce

Services available on internet - WWW - ISP.

E commerce : Meaning .advantages and limitations, applications of E commerce -trading stocks online, ordering products / journals / books etc., online, travel and tourism services, employment placement and job market, internet banking, auctions, online publishing, advertising-Online payment system..(including practicals)

Lab Work:
MS DOS
MS WINDOWS
MS WORD
MS EXCEL
MS ACCESS
MS POWERPOINT
INTERNET AND E COMMERCE PRACTICALS

References:
1.   Information Technology : Dennis P. Curtin, McGraw Hill International
2.   Fundamentals of Computers : P. Mohan, Himalaya Publishing House
3.   Fundamentals of Computers : Atul Kahate, Tata McGraw Hill
4.   Fundamentals of Computers : V. Srinivas, Kalyani Publications
5.   MS Office : Sanjay Saxsena
6.   MS Office : BPB Publications
7.   E commerce : CSV Murthy, Himalaya Publishing House
8.   Raymond Green Law : Fundamentals of the Internet, Tata McGraw Hill
9.   Efraim Turban : Electronic Commerce, Pearson Education
10.   E-Commerce, E-Business : C.S. Rayudu, Himalaya Publishing House.

11. Fundamentals of Information Technology : Deepak Bharihanke, Excel
12. Understanding Computers : Morley, Cengage

PROGRAMMING CONCEPTS USING C

Unit – I :   Max. Marks : 70+30

Fundamentals of C programming Branching in C, If Statement, If-Else Statement, Nested if Statement, if-else if; goto statement, Switch, Break Statements, Loops, For, While, Do while, Nesting of Loops

UNIT – II :

Functions in C, Global and Local Variables, Parameter Passing, Standard Functions in Header files, Recursion.

Array in C, One Dimensional Arrays and Multi dimensional Arrays, Arrays as function arguments, Sorting, Searching and Merging.

UNIT – III

Data types, Scope and Visibility, Automatic Conversion of variables, different types of variables, include directive, define directive, define with arguments.

Pointers in C-Arrays and Pointers, Pointers to Functions, pointers and Strings command line arguments.

UNIT – IV

Structures and Unions Arrays as Structure Member, nested structure array of structures, structures as function arguments, pointers to a Structure, input and output elementary functions.

Unit – V

Screen Control, Creation of Windows, new design advanced file management, binary files, direct access files

Prescribed Book :
THINKING IN C By P.B. Mahapatra

Reference Books :
ANSI-C By Bala Guruswamy
C By Kernighar and Ritche
Complete Reference C By Herbert Schlidt

B.Com. - SECOND YEAR

ADVANCED ACCOUNTING

Paper : 201

PPW : 5+1   Max. Marks : 70+30

Objectives:

1   To appraise the students about the application of accounting knowledge in special business activities.

2. To impart the skills of preparation of final accounts of non- trading concerns, partnership, organizations.

3. To develop the skills of recording of transactions relating to issue of shares and debentures, branches and departments manually and using computers.

UNIT - I :   Accounts from Incomplete Records - Hire purchase and installment purchase system.

Single Entry : Features - books and accounts maintained- Recording of transactions -Ascertainment of Profit. -(Statement of Affairs method only).

Hire Purchase System - Features — Accounting Treatment in the Books of Hire Purchaser and Hire Vendor - Default and Repossession -Installment Purchase System -Difference between Hire purchase and Installment purchase systems -Accounting Treatment in the books of Purchaser and Vendor

UNIT - II :   Branch and Departmental Accounts :

Dependent Branches: features-Books of accounts- methods of accounting of dependent branches - Debtors System, Stock and debtors system — Recording of transaction relating to branch accounts using computers.

Departmental Accounts: Need, features, Basis for Allocation of Expenses, treatment of Inter - Departmental Transfer at cost or Selling Price-Treatment of Expenses that cannot be allocated - Preparation of departmental profit and loss.

UNIT - III : Accounting of Non-Profit Organizations :

Non-Profit entities-Features of non-profit entities - Accounting process-Preparation of summaries -Receipts and Payments Account

meaning and special features-Procedure for preparation-uses and limitations.

Income and Expenditure Account- features- procedure for preparation-preparation of Balance Sheet

UNIT - IV : Partnership Accounts:

Legal provisions in the absence of Partnership Deed - Fixed and Fluctuating Capitals -Preparation of final accounts. - Accounting Treatment of Goodwill and Admission of a partner. .

Accounting treatment of Retirement and Death of a Partner - Dissolution of Firm (Excluding Sale to Firm, Company and Amalgamation) - Recording of partnership transaction and preparation of final accounts using computers. (24 hours)

UNIT - V : Company Accounts:

Issue of Shares at par, Premium and at Discount - Forfeiture and Reissue of Shares-Rights issue (Theory Only) - Recording of transactions relating to issue of shares using computers.

Issue and Redemption of Debentures - Redemption out of profits sinking fund method. Recording of transaction relating to issue and redemption of debentures using computers Underwriting of Issue of Shares(Simple **Problems**)

Suggested Readings:

1.	Principles and Practice of Accounting R.L. Gupta & V.K. Gupta Sulthan Chand &sons
2.	Accountancy - I : Tulasian, Tata Mcgraw Hill Co
3.	Accountancy - I : S.P. Jain & K.L Narang , Kalyani Publishers
4.	Financial Accounting : Dr.V.K.Goyal, Excel

Books

5.	Introduction to Accountancy : T.S.Grewal, S.Chand and Co
6.	Accountancy-I : Haneef and Mukherjee, Tata Mcgraw Hill co
7.	Advanced Accountancy : Arulanandam, Himalaya publishers
8.	Advanced Accountancy-I : S.N.Maheshwari & V.L.Maheswari, Vikash Publishing Co.

BUSINESS STATISTICS (202)

PPW : 5+1   Max. Marks : 70+30

  The objective of this paper is to impart knowledge on the application of statistical- tools and techniques in business decision-making & use of MS-Excel in interpretation of statistical data.

UNIT - I : Introduction to Statistics :

Meaning, definition, importance and limitations of statistics. Collection of data- Primary and Secondary data -(Sampling-Random-Non Random-Census)- Schedule and questionnaire - Frequency distribution -Tabulation-Diagrammatic and. graphic presentation of data using Computers (Excel).

UNIT - II : Measures of Central Tendency :

Definition Objectives and Characteristics of measures of Central Tendency-Types of Averages - Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode, Deciles, Percentiles, Properties of averages and their applications. Calculation of averages using computers.

UNIT - III : Measures of dispersion and Skewness :

Meaning, definitions, Properties of dispersion-Range-Quartile Deviation -Mean Deviation-Standard Deviation- Coefficient of Variation-Skewness definition-Karl Pearson's and Bowley's Measures of skewness-Normal Distribution Calculation of Dispersion and skewness using Computers.

UNIT - IV : Measures of Relation :

Meaning, definition and use of correlation - Types of correlation-Karlpearson's correlation coefficient - Spearman's Rank correlation-probable error-Calcuation of Correlation by Using Computers.

Meaning and utility of Regression analysis comparison between, correlation and Regression - Regression Equations-Interpretation of Regression Co-efficient. Calcuation of Regression by Using Computers.

UNIT - V : Analysis of Time Series & Index Numbers:

Meaning and utility of time series Analysis- Components of Time series-Measurement of trend and Seasonal Variations - Utility of Decomposition of Time Series-Decentralization of Data-Calculation

of trend and seasonal variations using computers.

Meaning, Definition and Importance of Index Numbers-Methods of Construction of Index Numbers - Price Index Numbers - Quantity Index Numbers -Tests of Adequacy of Index Numbers - Deflating Index Numbers - Cost of Index Numbers-Limitation of Index Numbers. Calculation of index numbers using computers.

Suggested Readings:

1. Business Statistics : Reddy, C.R Deep Publications, New Delhi.
2. Statistics-Problems and Solutions : Kapoor V.K.
3. Fundamentals of Statistics : Elhance .D.N
4. Statistical Methods : Gupta S.P.
5. Statistics : Gupta B.N.
6. Fundamentals of Statistics : Gupta S.C.
7. Statistics-Teory,Methods and Applications : Sancheti, D.C. & Kapoor V.K.
8. Practical Business Statistics : Croxton & Crowdorv.
9. Statistics and their applications to Commerce : Borddigtion
10. Statistics Concepts & Applications : Nabendu Pal & Sahadeb Sarkar
11. Business Statistics,An Applied Orientation : P.K. Viswanathan
12. Business Statistics : J.K. Sharma
13. Business Statistics : Bharat Jhunjhunwala
14. Busniess Statistics : R.S. Bharadwaj

PAPER : 203
FINANCIAL SERVICES - BANKING & INSURANCE

PPW : 5   Max. Marks : 70+30

Objectives :

To impart knowledge on Banking and Insurance concepts and to gain an insight on Financial Services

UNIT – I : Introduction of Financial Services

a. Meaning of Financial Services, Structure of Indian Financial System Importance of Financial System for the economic development. (Financial and Banking system charts)

b. Definition of Bank, Functions of Commercial Banks and Reserve Bank of India. (Forms of various accounts and deposits)

c.   Definition/Meaning of Insurance and reinsurance, Principles of Insurance, kinds of Insurance, advantages of insurance, globalization of insurance and insurance sector reforms in India.

UNIT – II : Banking Systems and its Regulation

a.   Banking Systems – Branch banking, Unit Banking, Correspondent banking, Group banking, Deposit banking, Mixed banking and Investment banking. An overview of banking; Banking Sector Reforms with special reference to Prudential Norms: capital adequacy norms, income recognition norms, classification of assets and NPAs; Innovations in Banking-ATMs, E-Banking, Credit, Online & Offshore Banking, etc (working and operations)

Regional Rural banks, Cooperative banks, Micro Finance, Priority Sector Lending, Indigenous banking, Role of NABARD, Development Financial institutions – **SFC.SIDBI.**

UNIT – III : Banker and customer, loans and advances :

a.   Banker and customer definition and their relationship, types of customers and modes of operations, procedure and precaution for opening an account, pass book & its features, Rights, duties and obligations of the banker. (Application forms for opening accounts, Cheque Books, pass books, requisition slips for withdrawals and deposits, bank statements, etc)

b.   Promissory Note and Bills of Exchange and Cheque, differences between them, types of crossing the cheque, payment of cheque and consequences of wrongful dishonor, collection of local and upcountry cheques, responsibility and liabilities of collecting banker and statutory protection to the collecting banker. (Promissory notes, B/E, Crossed cheques-various modes)

c.   Types of loans and advances, principles of sound lending policies, credit appraisals of various forms of loans and advances- modes of creating charges- lien pledge, mortgage and hypothecation (Documents required for sanction of loans and advances)

UNIT – IV : Financial Markets & Services :

a.   Indian Money Market- Characteristics, Structure, composition (call and noti money, market, treasury bills market, CDs, CPs, short term bill mai MMMFs and DFHI) problems and reforms in Indian money market (CDs, CPs, Treasury Bills)

b. Indian capital market-composition and growth of primary and secondary markets, differences between primary and secondary markets, capital market reforms and NBFCs in capital markets; Stock Exchanges, NSE, OTCEI, Online Trading and role of SEBI.

c. Financial intermediaries and services : Merchant bankers, Mutual funds, Leasing companies, Venture Capital Funds, Forfeiting, Loan Syndics Factoring, Custodial Services, Depository Services, and Depository Participants. (Documentation)

UNIT – V : Types of Insurance and its regulation

a. Life Insurance – Practical aspects of Life Insurance, procedure for issuing a lift insurance policy, issue of duplicate policies, nomination, surrender value, policy loans, assignment, revivals and claim settlement. (Formats of types of Insurance)

b. Non Life Insurance- Types of products and scope of Fire Insurance, Tv Insurance, Health Insurance, Social Insurance and Rural Insurance. Regulate Insurance in India- Insurance Act, 1938 and IRDA 1999. (Formats of types of Life Insurance)

Books Recommended :

1. Maheshwari and Paul R.R. : Banking theory law and practice
2. Sundaram and Varsheney : Banking theory law and practice
3. Tannans : Banking law and practice in India
4. Aryasri : Banking and Financial System
5. M.Y. Khan : Indian Financial System
6. P.K. Gupta : Insurance and risk management
7. Vijaya Raghavan Iyengar : Introduction to Banking
8. Guruswamy : Banking Theory Law and Practice, Tata
9. Aryasri & Murty : Banking and Financial Systems, Tata
10. Guruswamy : Merchant Banking and Financial Services, Tata
11. Murthy and Venugopal : Indian Financial System, IK International
12. Paul Suresh : Management of Banking and Financial Services, Pearson

Paper - IV :
204 TAXATION

PPW : 4   Max. Marks : 70+30

Objectives :

To equip the students with the working knowledge of both direct and indirect taxes.

UNIT - I : Introduction

Taxes - Meaning - Need for and Rationale of taxes - Direct and Indirect Taxes - Constitutional Provisions on Taxation - Union List - State List - Tax Rates - Blanket Rate Method - Slab Rate Method - Surcharge - Cess - Progressive v/s Regressive Taxes. - An Overview of Taxation System in India.

UNIT - II : Income Tax

Income Tax Act 1961 - Important Definitions - Residential Status - Incidence of Tax - Exempted Incomes - Agricultural Income - An overview of five heads of income - Deduction - Set off and Carry Forward of losses - Assessement of Individual - Computation of Taxable Income - Return Filling and Assessment thereof. - Collection and Recovery of Taxes - Tax Deducted at Source - Advance Tax. - (Including Problems)

Lab Work : Filling Relevant Forms for Individual Assessees.
Format and filling of Form : 16
Format and filling & filling of ITR-1 & ITR-2

UNIT - III : WEALTH TAX

Wealth Tax Act 1957 - Charge of Wealth Tax - Valuation Date - Location of Assets - Assets - Meaning - Deemed Assets - Exempted Assets - Net Wealth - Computation of Net Wealth - Valuation of Assets - Return of Wealth and Procedure of Assessment - Time Limit for Completion of Assessment. (Including Problems)

Lab Work : Computation of Tax liability.

UNIT - IV : Sales Tax & Service Tax

Central Sales Tax :- Definitions - Dealer, Declared Goods, Place of Business, Sale, Sale Price, Turnover - Inter State Trade or Commerce - Computation of Taxable Turnover - Assessment and Returns under CST Act (Including Problems)

APVAT Act, 2005 - Statement of Objectives and Reasons - Definitions : Business Casi Trader, Dealer, Input Tax, Output Tax, Place of Business, Tax Invoice, Total Turnover Tax. - Computation of Taxable Turnover - Registration Procedure (Including Problems)

Service Tax Act, 1994 - Introduction - Meaning of Service - Classification of Taxo Services - Valuation of Taxable Services - Registration - Assessment Procedure.

UNIT - V : Central Excise & Customs

Central Excise Duty - Definitions - Taxable Event under Central Excise - Types Duties - Classification - Valuation - Registration Procedure - CENVAT Credit.

Customs Duty - Important Definitions - Goods, Import, Export, Importer, Expoi Territorial Waters, India, Bill of Entry - Import and Export Procedure - Vary Documents used in Foreign Trade –- Baggage - Stores - Valuation Rules.

References :
1. Direct taxes law & practice - Vinod K Singhania, Kapil Singhania, Taxmann.
2. Direct taxes law & practice - Girish Ahuja, Dr. Ravi Gupta, Bharat's
3. Direct taxes law & practice - BB Lai – Pearson's
4. Indirect taxes law & practice - V.S. Datey, Taxmann's
5. Indirect taxes - V. Nagaragan, Asia Law – House
6. Central Exercise Mannual - Law & Procedure - P. Verra Reddy, Asia Law House
7. Andhra Pradesh VAT Act & Rules - N.K. Acharya, Asia Law House
8. Elements of Income Tax - Dr. P.V. Ramana Rao, Dr. A. Sudhakar D:
9. Krishnaiah Goud, National Publishing House
10. Income Tax Law & Practice - Gaur & Narang, Kalyani Publishers
11. Income Tax - Tata Mcgraw Hill
12. Income Tax Law and Practice - N. Hariharan, Tata
13. Income Tax and Central Sales Tax : Lai Vashist, Pearson
14. Direct Taxes : Lai Vashist, Pearson

Paper - IV :

BUSINESS DATA PROCESSING SYSTEM (204)

PPW : 5   Max. Marks : 70+30

UNIT – I :

Data and information-Limitations of manual data processing – Advantages of data Base BDMS-Functions of DBA-Elements of DBMS: DDL DML Entities, Sets and attributes. Data Base Tables: Keys-Primary, secondary, composite and foreign key.

UNIT – II :

Relational Data Base : Entity-relationship-Types-I:I, I:M, M:N, Strong and weak entities, Recursive Data Base Design, Normalization : First, Second, third, BCNF fourth. Class diagrams and entity relationship tables.

UNIT – III :

Creating Data Bases : Creating tables modifying table structures-Data entry- Edit-Delete-Importing-Exporting tables using MS Access.

UNIT - IV :

Queries : QBE-Select queries-Grouping-Parameters-Data formatting, queries based on multiple sources-Cross tab queries-Action queries-Make table queries-append-Delete and Update queries using MS-Access.

UNIT - V :

Forms and Reports; Forms : Functions and uses-Creating, Modifying labels-List boxes-Dialog boxes. Reports: Creating-Modifying reports-Creating Reports with Report wizard-Report Graphics-Label output format-Form letters. (Using MS Access)

Lab Work : (MS Access)

Creating tables entering data, viewing, editing, sorting, deleting, moving data in Tables Simple queries using Employee data base, inventory database, product data base, invoice data base, customer database. Creating forms and reports using the database stated in item no. 2

Books Recommended :

1. Perer Norton : Introduction to Computers (2nd Ed), TMH, New Delhi, 1998.

2. Basandra K. Suresh : Computers : Today, Galgotia Publications New Delhi, 2000.

3. Rob Peter and Semaan Elie : Data Bases : Design, Development & Development using MS Access, TMH, New Delhi, 2000.

ELECTRONIC COMMERCE (203)

PPW : 5   Max. Marks : 70+30

UNIT – I :

Overview of Electronic Commerce Definition of Electronic Commerce- E-Business – Potential Benefits of Electronic Commerce – The Internet and World Wide Web (WWW) as enabler of E-Commerce- Impact if E-Commerce on Business Models- E-Commerce Applications- Market forces influencing highway- Global Information Distribution Networks.

UNIT – II :

E-Commerce and WWW- Architecture Framework- Technology behind the Web-Hyper text Publishing – Security and the Web-Security protocols and the Web Security issues-Encryption techniques.

UNIT - III :

Consumer Oriented E-Commerce Applications- Mercantile Process Models from Consumers and Merchant's Perspective- Electronic Payment Systems- Types of Payment System (Credit Card; E-Cash, Smart-Cards-Digital Payments, etc.,)- Risks in E-Payments-Designing E-Payment Systems.

UNIT - IV :

Electronic Data Interchange (EDI)- EDI applications in business-Legal, Security and Privacy Issues in EDI and E-Commerce-Internet based EDI-Intra Organizational E-Commerce.

UNIT - V :

Web-based Marketing- Introduction and Scope of Marketing-Business, Marketing and Information Technology congruence-

Advertising and Marketing on the internet-Application of 4 Ps (Product, Price, Place & Promotion) in internet-Marketing Supply Chain Management.

Lab Work :

Using Microsoft front-page editor and HTML in Designing a State (simple) Website.

Suggested Reading :

1.   E-Commerce : A Managerial Perspective : Michael change. Et. A1

2.   Electronic Commerce – Security : (Greenstein & Feinman Risk Management & Control

3.   Frontiers of Electronic Commerce : Ravi Kalakota & A.B. Whinston

B.Com. III - Year (Regular & Restructures Courses) - New - 2011

B.Com. (CC)	B.Com. (Computers)	B.Com. (Insurance)	B.Com. (A&SM)	B.Com. (Taxation)	B.Com. (Tax Procedures and Practices)	B.Com. (Corporate Secretary ship)
Paper-I : Business Laws (70+30 Assign)	3	3	3	3	3	3
Paper-II : Corporate Accounting (70+30 Assign)	3	3	3	3	3	3
Paper-III : Cost and Management Accounting (70+30 Assign)	3	3	3	3	3	3
Paper - IV : Auditing (70+30 Assign)	3	3	3	3	3	3
Paper-V : Business Communication (100 Theory)	3	3	3	3	Data Business Management Systems (70+30 Assign)	3
Paper-VI : Advanced Corporate Accounting (70+30 Assign)	WEB Programming 70 = Theory + 30 = Practical	Fire and Marine Insurance (100 Theory	Sales Promotion and Sales Management (100 Theory)	Sales Tax (Central AP & Excise & Customs Act (100 Theory)	Income Tax Procedures & Practice - II (100 Theory)	Secretarial Practice (100 Theory)
Paper-VII : Advanced Management Accounting (70+30 Assign)	Relational Database Management Systems 70 = Theory + 30 = Practical	Properties and Liability Insurance (100 Theory)	Advertising - II (100 Theory)	Corporate Tax Management (100 Theory)	Other Taxes (100 Theory)	Corporate Law and Practice - II (100 Theory)

B.Com. THIRD YEAR

Paper -1 :
BUSINESS LAWS

Paper : 303   Max. Marks : 70+30
PPW : 4+1

Objective:

To make the students learn the basics of business laws and apply them in real life situations.

UNIT - I : Contract Act :

1. Agreement and Contract: Definition and meaning - Essentials of a valid contract -types of contracts.

2. Offer and Acceptance: Definition - Essentials of a valid offer and acceptance -communication and revocation of offer and acceptance.

3. Consideration: Definition and importance - Essentials of valid consideration - the Doctrines of "Stranger to Contract' and 'No Consideration - No Contract' - Capacity to contract - special rules regarding minor's agreements.

4. Consent: Free Consent - Flaw in Consent: Coercion - Undue influence - Fraud -Misrepresentation and Mistake.

(Lab work: Students are expected to know the cases of Contract Act and able to create a written Contract)

UNIT - II : Discharge of a Contract:

1. Legality of object and consideration:- illegal and immoral agreements - agreements opposed to public policy.

2. Agreements expressly declared to be void - wagering agreements and contingent contracts.

3. Discharge of a contract- various modes of discharge of a contract-performance of contracts.

5. Breach of a contract - types - remedies for breach of a contract

UNIT - III : Sale of Goods Act:

1. Contract of sale: Definition - features - definition of the term goods - types of goods - rules of transfer of property in goods - differences between sale and agreement to sell.

2. Rights of an unpaid seller.

3. Conditions and warranties - meaning and distinction - express and implied conditions and warranties - sale by non-owners - auction sale.

(**Lab work:** Students are expected to know the cases and practical problems relating to the Sale of Goods act. Students are advised to refer to the Internet Website and prepare the assignments)

UNIT - IV: Consumer Protection Act and Intellectual Property Rights :

1. Definitions of the terms consumer, unfair trade practices, restrictive trade practices and complainant- rights of consumers - consumer protection councils - consumer redressal agencies - penalties for violation.

2. Intellectual Property Rights: Meaning - Need and objectives- Meaning of the terms industrial property, literary property, copy right, patents, trade marks, trade names, trade secrets, industrial designs, geographical indications. Information Technology Act, 2000: aims and objectives - a brief overview of the Act.

(**Lab work:** Students are expected to know the Model for of a complaint. Check list of requirements for petition to be filed before the National Consumer Disputes Redressal Commission; cases and practical problems under the Consumer Protection Act and Right to Information Act. Students are advised to refer to the Internet Website and prepare the assignments)

UNIT - V: Company Law :

1. Doctrine of ultra vires and its effects - doctrine of constructive notice - doctrine of indoor management - exceptions.

2. Management of companies - directors - qualifications - disqualifications -appointment - removal - rights and duties - company meetings and resolutions -appointment of a company secretary.

3. Winding up of companies - various modes - compulsory winding up- powers and duties of official liquidator - members and creditors voluntary winding up - winding up subject to the supervision of the court-dissolution.

(**Lab work:** Students are expected to know the cases of Companies Act. Students are advised to refer to the Internet Website and prepare the assignments)

Suggested Readings:

1. S.S.Gulshan: Mercantile Law: Excel Books.
2. Kapoor ND: Merccntile Law, Sultan Chand
3. Kapoor ND: Company Law, Sultan Chand
4. S.N.Maheshwari : Business Laws - Himalaya
5. Balachandran V: Business Law, Tata
6. Tulsian: Mercantile Law, Tata
7. Tulsian: Busiess Law, Tata
8. Gogna: A Text books of Business and Industrial Law, S.Chand
9. Pillai Bhagavathi: Business Law, S.Chand
10. Gogna : A Text Book of Mercantile Law, S. Chand
11. Gogna: A Text Book of Company Law, S. Chand
12. S.S.Gulshan: Business Law: Excel Books
13. Bulchandani - Business Laws: Himalaya
14. Maheshwari & Maheshwari: Mercantile Law: Sultan Chand
15. Bare Acts of different laws (As per the syllabus)- Law Publico
16. Company Act- Law Publico
17. Consumer Protection Act-Law Publico
18. IPR (Intellectual Property Rights)- Law Publico
19. Cases of different Business laws- Law Publico

PAPER - II
CORPORATE ACCOUNTING

Paper : 301   Max. Marks : 70+30
PPW : 4+1

Objectives :

1. To provide the knowledge relating to the Accounting Standards.
2. To enable students to prepare final accounts using Accounting package
3. To enable the students to prepare financial statements of Insurance and Bank Companies.

UNIT - I : Accounting Standards - Valuation of Goodwill and Shares

Accounting Standards - Need and importance - An overview of Indian Accounting Standards.

Valuation of Goodwill - Need and methods - Normal Profit Method. Super Profits Method - Capitalization Method

Valuation of shares - Need for Valuation - Methods of Valuation - Net assets method, Yield basis method, Fair value method.

UNIT - II : Company final accounts - issue of Bonus shares and Profits Prior to incorporation.

Preparation of Final Accounts - Provisions relating to preparation of final accounts -Profit and loss account and balance sheet.

(Computer lab work: Preparation of final accounts using computers.)

Issue of bonus shares-Provisions of company's Act and SEBI guidelines. Acquisition of business and profits prior to incorporation. -Accounting treatment.

UNIT - III : Amalgamation and Internal Reconstruction

Amalgamation - In the nature of merger and purchase - Calculation of purchase consideration -Treatment in the books of transferor and transferee (as per Accounting Standard 14, excluding inter- company holdings)

(Computer lab work: Recording of transactions relating to mergers using computers.)

Internal Reconstruction - Accounting Treatment- Preparation of final statements after reconstruction.

(Computer lab work: Recording of transactions relating to Internal Reconstruction using computers.)

UNIT - IV: Bank Accounts

Bank Accounts -Books and Registers to be maintained by banks-Slip system of posting-rebate on bills discounted-Schedule of advances -Non Performing Assets -Legal provisions relating to Preparation of final accounts .

(Computer lab work: Preparation of bank Final Accounts using computers

UNIT - V : Accounts of Insurance Companies

Life Insurance Companies -Preparation of Revenue Account, Profit and loss account Balance Sheet and Valuation Balance Sheet. General insurance Preparation of final accounts-with special reference to fire & marine insurance only.

Suggested Readings:

1. Principles and Practice of Accounting R.L. Gupta & V.K. Gupta; Sulthan Chand & Sons
2. Advanced Accountancy, Vol-II, S.N.Maheshwari & V.L.Maheswari
3. Accountancy - III, Tulasian, Tata Mcgraw Hill Co.
4. Advanced Accountancy, Arulanandam; Himalaya publishers;
5. Accountancy - MLS.P. Jain & K.L Narang; Kalyani Publishers
6. Modern Accountancy Vol-ILHaneef and Mukherjee Tata Mcgraw Hill Co.
7. Vikash Publishing Co.
8. Advanced Accountancy: Shukla and Grewal; S.Chand & Co
9. Advanced Accountancy - R.L. Gupta and Radhaswamy, Sulthan Chand & sons
10. Financial Accounting - Dr. V.K.Goyal-Excel Books
11. Introduction to Accountancy - T.S.Grewal, S.Chand and Co.
12. Corporate Accounting - Goyal VK - Excel
13. Corporate Accounting - Verma KK Excel
14. International Accounting-Das Mohapatra, PHI

PAPER - III
COST AND MANAGEMENT ACCOUNTING

Paper : 302   Max. Marks : 70+30
PPW : 4+1

Objectives:

1. To impart conceptual knowledge of costing and management accounting
2. To train the students in finding the cost of products using different methods of costing
3. To equip basic skills of analysis of financial information to be useful to the management

UNIT - I : Introduction

Cost Accounting: definitions, features, objectives, functions, scope, advantages and limitations. Management Accounting: definitions, features, objectives, functions, scope, advantages and limitations. Relationship between cost, management and financial accounting.

Cost concepts-Cost classification -preparation of cost sheet. Relationship of costing department with other departments.

UNIT - II : Elements of Costs.

Material Cost: direct and indirect material cost, Inventory control techniques-stock levels, EOQ. ABC analysis. Issue of materials to production- pricing methods-FIFO, LIFO with base stock, average methods. Labour cost: direct and indirect labour cost-methods of payment of wages including incentive plans -Halsey and Rowan plans, Tailors Piece Rate method.

Overheads: features, classification, methods of allocation and apportionment of overheads.

(Computer lab work: Computation of stores ledgers, labour cost / payment of wages, and overheads - using accounting package)

UNIT - Ill : Methods of Costing.

Single or Output Costing, job and contract costing : Features, costing process-computation of cost

Process Costing: features, treatment of normal and abnormal losses, preparation of process cost accounts (excluding equivalent products and inter process profits)

(Computer lab work: Cost sheet preparation, job and contract costing and computation of process costs - using accounting package)

UNIT - IV : Costing Techniques for Decision making:

Marginal Costing-Meaning - Importance - Marginal cost Equation - Difference between Marginal costing and Absorption costing - Applications of Marginal costing -Break Even Analysis-Meaning and Importance - Break even chart and different formulas (Simple problems)

Budgets - Meaning and importance - Budgeting-meaning and importance -Budgetary Control-Meaning and importance-Types of Budgets - Fixed Budget-Flexible Budget-Cash Budget - Sales Budget - Production budget (Simple problems)

Standard Costing-Meaning and Importance-Variance analysis-Material and labour Variances (Simple problems).

(Computer lab work: Budgeting, Marginal costing & calculation of Break-even and standard costs determination - using excel package / accounting package)

UNIT - V : Financial Statement analysis:

Financial statements-features, limitations. Need for, Meaning, objectives, and process of financial statement analysis-Methods and techniques of analysis (Theory Only)

Fundsflow Analysis and Cashflow Analysis (as per AS-3)

Ratio Analysis. Calculation of liquidity, solvency, profitability and turnover ratios-Interpretation of ratios

(Computer lab work: Financial statement analysis, funds flow, cash flows and ratio analysis - using excel package / accounting package; Preferably, students are expected to learn financial statement analysis using Excel features)

Suggested Readings:
1. Cost and Management Accounting : Jain and Narang, Kalyani Publishers
2. Microsoft Office Excel 2003 and 2007 : Step by step, Frye, PHI
3. Cost and Management Accounting : M.N Arora Himalaya Publishing

PAPER - IV
AUDITING

Paper : 304   Max. Marks : 70+30
PPW : 4 + 1

Objectives :
i)   To impart knowledge pertaining to basic concepts of auditing
ii) To acquaint oneself with auditing procedure and report Writing.

UNIT - I : Introduction to Auditing

Auditing: Meaning-Definition-Evolution-Objectives-importance.

Types of audit: Based on ownership (Proprietorship, Partnership, Companies, Trusts, Cooperative Societies. Government Departments) - Based on time (Interim, Final, Continuous, Balance Sheet)- Based on objectives (Independent, Financial, Internal, Cost, Tax. Government, Secretarial).

UNIT - II: Planning of Audit and Control

Auditor: Qualifications and disqualifications - Qualities - Appointment and Reappointment -Remuneration - Removal - Rights - Duties - Liabilities.

Audit planning: - Engagement letter - Audit programme -Audit note book -Audit papers -Audit work book - Audit contents - Audit markings - Internal check- Internal control -(Sales-Purchases-Fixed assets-Cash-Bank-Pay Roll) - Accounting controls and Sampling in audit. (Lab Work: Preparation of Audit programme for an organization.)

UNIT - III : Vouching and Audit of Financial Statements

Vouching: Meaning- Vouching of cash and trading transactions - Investigation, Verification and Valuation of assets and liabilities- Differences between vouching, investigation, verification and valuation. Audit of Financial Statements: Receipts - Payments - Sales -Purchases - Fixed assets - Investments -Personal ledger- Inventories - Capital and Reserves -Other assets - Other liabilities. (Lab Work: Vouching of cash book of a local business unit.)

UNIT - IV : Audit of Institutions

Audit of institutions: Partnership - Manufacturing and Other Companies -Non-trading concerns.

Audit Report: Contents - Preparation of audit report- Fair report - Qualified report.

Lab Work: Collection of Model Audit Reports from Local Auditor and Preparation of similar reports.

UNIT - V: Report Writing

Business Correspondence and Report writing: Basic principles - Business letters. Business reports: Structure - Preparation of Routine reports and special reports.

(Lab Work: Drafting of model business letters and Preparation of business reports.)

Suggested Readings :

1. Practical Auditing (Himalaya Publication) : R.G. Saxena
2. Contemporary Auditing : Kamal Gupta
3. Contemporary Auditing : Spicer & Pegler
4. Principles and Practices of Auditing : Jagdish Prakash
5. Principles of Auditing : Ghatalia
6. Business correspondence and report writing : Tata M. Graw Hill
7. Business Correspondence and Report Writing : Urmila Rai & S.M. Rai
8. Business communications and Report Writing : Kalyani Publications
9. Auditing : N.D. Kapoor

10. Practical Auditing : T.N. Randon
11. Auditing : Dinkar Pagare
12. Fundamentals of Auditing : Kamal Gupta and Ashok Gupta
13. Auditing Principles and Techniques : Basu SK
14. Auditing Principles & Practice : Kumar Sharma, PHI

PAPER - V
BUSINESS COMMUNICATION

Paper : 305   Max. Marks : 100
PPW : 4+1

UNIT - I :

Role of Communications Business: Basic Elements of communication process level of communication - Forms, Model and media of communication - Verbal and nonverbal communication - functions and Types.

UNIT - II :

Organisational Communication: Communication dimensions in organizations Net work - communication structures - Communication in different situations.

UNIT - III :

Non-Verbal Communication: Intra and inter personal communication - The process of Intra and inter personal communication. The effects of Intra and Inter personal variables on effective communication.

UNIT - IV :

Verbal Communication: Business letters - Types - basic principles, Style and tone - Letters relating to calling for a post, Calling for interviews -Appointment orders - Termination order - Business Enquiries - Orders Regret - Conciliaiton of orders - Complaints and Adjustments.

UNIT - V :

Report Writing: consideration - Types of report - Preparation of report format - Principles of writing a report - Feed Back on the Report - Common Errors.

PAPER - VI
WEB PROGRAMMING

UNIT - I :

HTML Programming Introduction - Formatting Text-Forms & Formulating Elements - Graphics in HTML Creating Tables & Frames - Web Design Principles.

UNIT - II :

VB Scripting Introduction - VB Script - Basics of VB Script - Array Handling -User Interaction in VB Script - Data Validation in VB Script - Handling Runtime Errors.

UNIT - III :

Dynamic HTML Programming Introduction - Cascading Style Sheets (CSS) -Events Handling - Changing Text and Attributes - Dynamically Changing Style, Text, Graphics and Placements - Creating Multimedia Effects with Filters and Transactions.

UNIT - IV :

Active Server Pages (ASP) Introduction - Scripting Languages and Script Engines in ASP - ASP Objects - Data Access Technology - ASP Application - Information Search Tools.

UNIT - V :

Extensible Markup Language (XML) Introduction - Creating XML Documents -XML Style Sheets - Hyperlinks in XML Documents - XML Document Object Model -XML Query Language.

Lab Work:

Creation of a Web site with Dynamic functionality using client-side and server - side scripting.

Suggested Readings :
1. Microsoft Official Curriculum.
2. Essential XML : Box
3. Dynamic HTML : Rule
4. HTML for the WWW : Castro

PAPER - VII

RELATIONAL DATABASE MANAGEMENT SYSTEMS

PPW : 5   Max. Marks : 70+30

UNIT - I :

Database Systems- Evolution- File Oriented Systems- Database Models database System Components- Database Systems in the Organisation- Data sharing Strategic Database Planning-database and Management Control- Risks and Costs and Databases-Database development.

UNIT - II :

Database Design-Principles of Conceptual Database Design- Conceptual Data Models- Aggregation- Modeling conceptual Objects vs. Physical Objects- Relational Data Model- Fundamental Concepts-Normalization-Transforming a conceptual model - Relational Model- Relational Database Implementation- Relational Algebra and Calculus.

UNIT - III :

SQL-Schema and Table Definition-Data Manipulation- View Definition Graphical Query Language-Client-Server Databases- Defining Database Tables and Server-Server Data Manipulation and Programming- Developing Client Applications

UNIT - IV :

Physical Database Systems- Storage Media- Disk Performance Factors- File Organisation- Implementing Logical Relationships- Mapping logical Data Structures to Physical Structures- Secondary Keys Access- Database Administration and Control DBA Functions- DBA Goals- Database Integrity- Database Security- Database Recovery

UNIT - V :

Distributed Database Systems-Design.- Query Processing- Data Integrity Recovery- Client/Server Systems- DBMS Selection and Implementation- Information Needs- DBMS Functions and Capabilities-Classifying DBMS feature requirement Evaluation Models- Implementation Issues- Case studies of RDBMS package such as ORACLE/MS-SQL Server.

Lab Work:

Using SQL commands creating Database Schem and Tables and Retrieval of data.

Suggested Readings :

1.   Modem Database Management: MeFadden
2.   An Introduction to Database System : Bipin C.Desai
3.   Database Management & Design : Gary Hansen & James. Hansesn.

B.Com. (General) THIRD YEAR

Paper - VI:
ADVANCED CORPORATE ACCOUNTING

Paper-E-III-1 P-1   Marks : 100 (70+30)

P.P.W. : 5 (4+1)

UNIT - I : Holding Companies :

The nature of holding companies - Legal requirements for a holding company - Accounts of holding companies - the consolidated balance sheet – Schedule VI of the Companies Act and subsidiary companies – form of consolidated balance – sheet – cancellation of investment account – minority interest – cost of acquiring control or goodwill – capital reserve – preference share capital in subsidiary companies – debentures in subsidiary companies – pre-acquisition profits/ reserves – pre-acquisition losses – inter-company transactions – unrealized profit on stock – contingent liabilities – revaluation of assets – bonus shares – treatment of dividend received from subsidiary company – good will in the balance sheet of subsidiary company – proposed dividend – interim dividend by subsidiary company.

Lab : Computation of Problems using Excel and Accounting packages.

Unit – II : Electricity Companies : (Double-Accounting System)

Meaning of double-account system – revenue account and **net** revenue account – capital account (receipts and expenditure on capital account) and general balance sheet. Replacement of an asset. Important provisions of Indian Electricity Act. 1910, Electricity supply act 1948 and the Companies Act 1956 – Formats of relevant accounts – calculation of reasonable return and disposal of surplus. Preparation of net revenue account and Balance sheet.

Lab: Computation of Problems using Excel and Accounting packages.

Unit - III : Accounting for price level changes (Inflation Accounting)

Introduction, history, limitations, profit measurement under different systems of accounting, methods of accounting for price level changes, current cost accounting (CCA) – methods, different approaches, measurement of profits, merits and demerits, preparation of income statement, cost of sale of adjustment, depreciation

procedure under CCA. Preparation of current cost balance sheet. (CCB).

Lab: Computation of Problems using Excel and Accounting packages.

UNIT – IV : Human Resource Accounting

Definition, objectives, approaches, assumptions, advantages, objections of HRA. Valuation methods. I IRA in India. I Human resource cost accounting, Historical cost accounting. Replacement cost method. opportunity cost method. Human resource accounting.

Social Responsibility Accounting : Meaning, Nature of social responsibility, need, objectives, accounting concept and objectives of social responsibility, indicators of social performance.

UNIT – V : Liquidation of Companies :

Scope, contributory preferential payments, preference dividend. Statement of affairs and deficiency surplus account. Liquidators final statement of account, liquidators remuneration, receiver for debenture holders. 13 list contributories.

Lab: Computation of Problems using Excel and Accounting packages.

Suggested Readings:

1. R.L. Gupta, M. Radha swamy : Corporate Accounting, Sultan Chand
2. M.A. Arulanandam. K.S. Raman : Advanced Accounting. Himalaya
3. Tulsania : Advanced Accounting. Tata Magrahills publications
4. Jain & Narang : Corporate Accounting, Kalyani publications
5. S.M. Shukla : Advanced Accounting. Sahilya Bhavan.

B.Com. (General) THIRD YEAR

Paper - VII:
ADVANCED MANAGEMENT ACCOUNTING

Max. Marks : 100

No.of. Hours P.P.W : 5   Time : 3 Hours

The objectives of this paper is to familiarize the student with the tools and skills of decision making in management accounting.

UNIT - I : Introduction :

Limitation of Financial Accounting – Employment of Management Accounting – Definition and scope – Role of Market Accountant – Controller functions-Managerial services – Management Information system.

UNIT - II : Business Budgets – Budgetary Control – Capital Budget :

Objectives, advantages, limitation and essentials of Budgets and Budgetary control – Organisation of Budgetary control – classification of Budget, - Flexible budgets. Fundamentals of Capital Budgeting – Preparation of capital budget.

UNIT – III : Working Capital :

Importance of working Capital – Estimation – Surplus character of investment – Fund flow statement – concept of Funds – Concept of flows- preparation of funds flow statement uses and limitation. Cash flow statement concept of cash-and notional – construction of cash Flow statement.

UNIT – IV : Marginal Costing & Break Even Analysis :

Concept- of Marginal costing – variable & absorption costing – Benefits and limitation cost, volume and profit analysis Break even point – Margin of safety – Make or buy decision.

UNIT – V : Standard Costing & Variance Analysis :

Standard costing and Hostorical costing – Establishment of cost standards – Steps involved in standard costing – variance analysis – Material variance-Material price variance – Material usage variance – Material Mix variance- Labour variance idle time variance – over heads variance.

B.Com. III Year (General) ELECTIVES - NEW - 2011.

I.   **INSURANCE**
1. Life Insurance
2. Non-Life Insurance

II.   **BANKING**
1. Baking in India
2. Computer Applications in Banking

III.   **RETAILING**
1. Retail Management
2. Retail Marketing & CRM

IV.   **TAXATION**
1. Income Tax - I
2. Income Tax - II

V.   **FINANCE**
1. Financial Management
2. Micro-credit and Foreign Trade Finance

VI.   **MARKETING**
1. Principles of Marketing
2. Rural Marketing

VII.   **SECRETARIAL PRACTICE & OFFICE MANAGEMENT**
1. Secretarial Practice
2. Office Management

VIII. **COMPUTER APPLICATIONS-I**
1. Database Management System
2. Electronic Commerce

IX.   **ACCOUNTING**
1. Advanced Corporate Accounting
2. Advanced Management Accounting

ELECTIVES

ELECTIVE - I : INSURANCE
PAPER - I   : LIFE INSURANCE
PAPER - II : GENERAL INSURANCE

LIFE INSURANCE

Paper - E-I: P-I Max. Marks : 100   P.P.W. : 5

UNIT - I :

Life Insurance : Concept / Definition. Basic Principles of Life Insurance: Utmost good faith, Insurable Interest, Co-operation and Law of Large Numbers.

UNIT - II :

Functions of Life Insurance - Total Personal Financial Planning, Risk Management - loss of life, loss of health, retirement.

UNIT - III :

Basic plans : Whole Life, Term, Endowment, and Unit Linked. Emergence and Nature of New Products in Advanced Countries: Flexible Premium Plans, Universal Life Policy.

UNIT - IV :

Health Insurance: Coverage and Plans; Annuities-Characteristics and Types.

UNIT - V :

Individual life and health insurance - Group Life and health Insurance - Types, Characteristics, Disadvantages & Advantages.

Suggested Readings:

1) Principles of Life Insurance: IC-01 Insurance Institute of India, Mumbai.
2) Practice of Life Insurance: IC-02 Insurance Institute of India, Mumbai.
3) Essentials of Risk management and insurance: Vaghan EMMETTJ and Therese.
4) Principles of Life Insurance: Dr. Shrikrishan Laxman Karve, Himalaya.
5) Principles & Practices of Insurance: Dr. P. Periaswamy, Himalaya.
6) Life & Health Insurance: Black, Pearson
7) Fundamentals of Life Insurance: Theory & Applications: Kaninika Misra, PHI
8) Insurance: Theory & Practice: Tripathy & Pal, PHI
9) Managing Life Insurance: Kutty, PHI.

NON-LIFE INSURANCE

Paper - E-I: P-II Max. Marks : 100   P.P.W. : 5

UNIT - I : Introduction to Risk and General Insurance :

Risk and Insurance - Concept of Risk pooling and Risk sharing - Role of General Insurance in economic development - General Insurance Market in India - General Insurance intermediaries.

UNIT - II : Principles of General Insurance :

Principle of Insurable Interest - Utmost Good Faith-Indemnity - Contribution - Subrogation - Proximate Causes

UNIT - III : Insurance Forms :

Proposal Forms - features - Insurance Policy-Definitions - Conditions Cover notes-Certificate of insurance - Endorsements-Renewal notice.

UNIT - IV : General Insurance Policies:

Fire Insurance; Marine Insurance; Miscellaneous insurance - Motor and Liability insurance policies.

UNIT - V : Claims :

Claims - Surveyors - Investigation - Negotiation and Assessment Reserves and Claims Expenses.

Suggested Readings:

1. Luthardt, Constance M. et.al. (1999): Property and Liability Principles, (3rd Edition), Insurance Institute of America, Malvern, Pa.

2. KSN Murthy and Dr. KVS Sarma: Modern law of Insurance in India, (4th Edition), Levix Nexis Butter worths India, New Delhi. 2002.

3. IC-01 : Principles of Insurance, Insurance Institute of India.

4. Mothihar, M. (2004): Insurance Principles, Practices Management & Salesmanship (1st Edition), Sharada Pustak Bhawan, Allahabad.

5. P.K. Gupta: Principles & Practice of Non-Life Insurance, Himalaya.

6. P.K. Gupta: Insurance in Risk Management, Himalaya.

7. Tripathi & Pal; Insurance Theory & Practice, PHI

ELECTIVE - VI : MARKETING
PAPER - I   : PRINCIPLES OF MARKETING
PAPER - II : RURAL MARKETING

PRINCIPLES OF MARKETING

Paper - E-VI: P-I Max. Marks : 100   P.P.W. : 5

UNIT - I : Introduction :

Nature and scope of marketing; Importance of Marketing as a business function, Importance of marketing in India context, Marketing concepts - Selling vs. marketing; Marketing mix; Marketing environment.

UNIT - II : Consumer Behaviour and Market Segmentation :

Nature, scope and significance of consumer behavior, consumer behavior theories, Market segmentation concept and importance; Bases for market segmentation.

UNIT - III : Product :

Concept of product, Types of products, New product development; packing role and function, Brand name and trademark; After sales services, Product life cycle concept.

UNIT - IV : Price & Promotion :

Importance, price as marketing mix; Factors influencing price determination of a product / service; Discount and rebates. Promotion: Methods of promotion; Optimum promotion mix; Advertisement media their relative merits and limitations.

UNIT - V : Distribution Channels and Physical Distribution :

Distribution channels -concept and role; types of distribution channels; Factors affecting choice of distribution channel; Retailer and wholesaler; Physical distribution of goods, Transportation; Warehousing; Inventory control; Order Processing.

Suggested Readings:

1. Philip Kotler : Marketing, Prentice Hall
2. William M. Pride and O.C. Ferrell : Marketing; Houghton -Mafflin Boston
3. Stanton W.J. et al: Fundamentals of Marketing, McGraw H
4. Lamb Charless W. et al: Principles of Marketing; South Western Publishing
5. Cravens David W et al: Marketing Management; Richard D. Irwin
6. Kotler Philip and Armstrong Gary: Principles of Marketing; Pearson
7. Fulmer RM: The New Marketing McMillan, New York
8. McCarthy J.E.: Basic Marketing -a Managerial Approach; McGraw Hill, New York.
9. Cundiff, Edward W et al: Basic Marketing -Concepts, Decisions & Strateties; PHI
10. Bushkirk, Richard H: Principles of Marketing; Dryden Pren, Illinois.
11. S.A. Sherlekhar: Marketing Management, Himalaya.
12. Govindarajan: Marketing Management: Concepts, Cases, Challenges & Trends, PHI
13. Chandra Bose: Modern Marketing, PHI.

RURAL MARKETING

Paper - E-VI: P-II Max. Marks : 100   P.P.W. : 5

UNIT - I : Rural Marketing :

Definition of rural area, Importance of rural marketing, nature and scope of rural marketing, size of rural market, Distinction between Rural and Urban Marketing.

UNIT - II : Rural Marketing Environment :

Geographical, economic, Scio-cultural and infrastructural factors. Factors influencing Rural marketing operations.

UNIT - III : Rural Consumer :

Characteristics, product and brand awareness in rural marketing - Attitude and behavior, Buying patterns and influences; Segmenting rural markets.

UNIT - IV : Rural Marketing Strategies :

Product Planning for rural marketing, quality and size; packaging and branding decisions, pricing decisions.

UNIT - V : Promotion and Distribution in Rural Markets :

Media and Advertising copy decisions; Distribution channels and logistics in rural markets.

Suggested Readings:

1. Rajagopal: Management Rural Business; wheeler Publications, New Delhi.
2. Neelameghan S. : Marketing in India; Cases and Reading; Vikas Publising House
3. Gopalaswamy T.P.: Rural Marketing; Wheeler Publishers, New Delhi.
4. Nayyar H., and Ramaswamy P: Globalization and Agricultural Marketing; Rawat Publications.
5. Moria CB : Agricultural Marketing: Himalaya Publishing House, New Delhi.
6. K.S. Habibur Rahman: Rural Marketing in India, Himalaya.
7. Krishnamacharyulu: Rural Marketing: Text & Cases, Pearson

B.A.

GENERAL ENGLISH

1. **B.A. (First Year)**

   - Poetry
   - Prose
   - Short Stories
   - One - Act Plays
   - Language Usage
   - Grammar & Vocabulary

2. **B.A. (Second Year)**
   - Poetry
   - Prose
   - Communication and Composition
   - Short Stories
   - One Act Plays
   - Information Transfer, Communication & Composition

1. **B.A. Modern Language (First Year)**
   Paper - I

   Unit - I   Language & Literature
   Unit - II   Forms of Poetry : Evolution, Kinds & Variations
   Unit - III Introduction to the Study of Drama
   Unit - IV   Introduction to the Study of Fiction

2. **B.A. Modern Language (Second Year)**
   Paper - II

   Unit - I   Poetry : Origin & Development
   Unit - II   Drama : Origin & Development
   Unit - III Prose : Origin & Development
   Unit - IV   Fiction : Origin & Development

3. **B.A. Modern language (Final Year)**
   Paper - III : Indian Writing in English

   Unit - I   Poetry
   Unit - II   Fiction
   Unit - III Drama
   Unit - IV   Prose

4. B.A. Modern language (Final Year)

Paper - IV : Literary Criticism

Unit - I   Phases of Literary Criticism

Unit - II   Philip Sidney : An Apologie for Poetry
John Dryden : An Essay on Dramatic Poetry

Unit - III   Samuel Johnson : Preface to Shakespeare
Matthew Arnold : The Study of Poetry

Unit - IV   Coleridge : Biographia Literaria Chapter XIV
Wordsworth : Preface to the Lyrical Ballads

Unit - V   T.S. Eliot : Function of Criticism
I.A. Richards : Four kinds of Meaning

GENERAL ENGLISH
FIRST YEAR

Second Language
TELUGU

B.A. (First Year)

Paper - I
Classical & Modern Poetry
Novel (Prajala Manishi)
Grammar

B.A. (Second Year)
Paper - II
Classical & Modern Poetry
Drama (Halikudu)
Prose
Alankaras

B.A. Modern Language (First Year)

Paper - I
Classical Poetry
Modern Poetry
Prose
Prosady

B.A. Modern Language (Second Year)
Paper - II
Telugu Sahitya Charitra
Drama (Swapna Vasava datta)

B.A. Modern language (Third Year)
Paper - III :
Basha Sahitya Charitra - Grammer

Paper - IV :
Kavya Sastra Parichayam

SECOND LANGUAGE
TELUGU
FIRST YEAR
PAPER - I
ఎ. ప్రాచీన కవిత్వం

1. కుమారాస్త్ర విద్యా ప్రదర్శనము – నన్నయ : ఆంధ్రమహాభారతము
    ఆది పర్వము షష్ఠాశ్వాసము 2 నుండి 63 వరకు

2. కీచకవధ – తిక్కన : ఆంధ్రమహాభారతము,
    విరాటపర్వము ద్వితీయాశ్వాసము 322 – 362 వరకు

3. దుర్యోధనుని విషాదము – ఎఱ్ఱన
    అరణ్య పర్వము – షష్ఠాశ్వాసము 2 నుండి 55 వరకు

4. ఉడుమూరి కన్నప్ప కథ – పాల్కురికి సోమన :
    బసవపురాణము – తృతీయాశ్వాసము

బి. ఆధునిక కవిత్వము

5. పూర్ణమ్మ   –   గురజాడ
6. జన్మభూమి   –   రాయప్రోలు
7. గ్రీష్మర్తువు   –   విశ్వనాథ
8. స్వేచ్ఛాగానము–1, స్వేచ్ఛాగానము–2 –   కృష్ణశాస్త్రి
9. మంజీర   –   దాశరథి
10. దేశచరిత్రలు   –   శ్రీశ్రీ

సి. ఉపవాచకము

నవల : ప్రజల మనిషి – వట్టికోట ఆళ్వారుస్వామి

డి. వ్యాకరణం : సంధులు, సమాసములు

1) సంస్కృత సంధులు :

    సవర్ణదీర్ఘ సంధి, గుణ సంధి, యణాదేశ సంధి, అనునాసిక సంధి, వృద్ధి
    సంధి, జశ్త్వ సంధి

2)   తెలుగు సంధులు :

అకార సంధి, ఇకార సంధి, ఉకార సంధి, త్రిక సంధి, గసడదవాదేశ సంధి, నుగాగమము సంధి, రుగాగమ సంధి, టుగాగమసంధి, ఆమ్రేడిత సంధి

3)   సమాసములు :

తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహుప్రీహి, అవ్యయీభావ సమాసము

SECOND YEAR
PAPER - II
ఎ. ప్రాచీన కవిత్వం

1.   శ్రీకృష్ణుడు వివాహమునకై బయలుదేరుట (రుక్మిణీ కళ్యాణము) – పోతన

శ్రీమదాంధ్ర మహాభాగవతము, దశమస్కంధము, పూర్వభాగము "అనియట్లు పలికిన..... నుండి తగునీచక్రి విదర్భ రాజసుత" వరకు (1717 నుండి 1742 వరకు)

2.   ప్రవరుడు సిద్ధని సేవించుట – అల్లసాని పెద్దన

మను చరిత్ర ప్రథమాశ్వాసము 48 నుండి 84 వరకు

3.   బోయ వాల్మీకిగా మారుట (రఘునాథ నాయకుడు)

వాల్మీకి చరిత్రము ద్వితీయాశ్వాసము
(తోరణంబులగు వీధుల నారంగట్టిన ...... నుండి కిరాతరాతలంపు హత్తికేవలంబు భక్తియె...... వరకు) 91 నుండి 125 వరకు)

4.   సీతారావణుల సంభాషణ – మొల్ల రామాయణము

సుందరాకాండ 43 నుండి 67 వరకు
(సీతను గనుంగొని రావణు.... నుండి ఆరూఢ ప్రతిమాన విక్రమ... వరకు)

బి. ఆధునిక కవిత్వం

5.   వృత్యాసాలు   – కాళోజి

6.   తప్పిపోయిన సత్యం   – కుందుర్తి

7. ముంతాజ్ మహల్   –   జాషువా

8. అదృష్టాధ్వగమనం   –   తిలక్

9. విశ్వంభర, ప్రథమ ఖండం –   డా॥ సి. నారాయణరెడ్డి

                              (నేను పుట్టకముందే నెత్తిమీద నీలితెర....
నుండి ఆవహించాడు మనిషి అంబరాన్ని
పిడిలించుకొని... వరకు

సి. నాటకము

హాలికుడు – శిరోమణి చలమచర్ల రంగాచార్యులు

డి. గద్యభాగము

1. వాఙ్మయము – జాతీయోద్యమ ప్రభావము – దేవులపల్లి రామానుజరావు
(తెనుగు సాహితి నుండి)

2. అల్లసాని పెద్దన – దువ్వూరి రామిరెడ్డి – కవికోకిల గ్రంథావళి (వ్యాసం)
శతజయంతి సంపుటి–2

3. జైలు – పొట్లపల్లి రామారావు (కథ)

4. గొల్లరామవ్వ కథ – పి.వి. నరసింహారావు (కథ)

ఇ. అలంకారాలు

1) శబ్దాలంకారములు :

వృత్త్యనుప్రాస, ఛేకానుప్రాస, యమకము, ముక్తపదగ్రస్తము లాటానుప్రాస,
అంత్యానుప్రాసము

2) అర్థాలంకారము :

ఉపమ, ఉత్ప్రేక్ష, రూపకము, శ్లేష, అర్థాంతరన్యాసము, స్వభావోక్తి

3) ఛందస్సు :

చంపకమాల, ఉత్పలమాల, శార్దూలము, మత్తేభము, తేటగీతి, ఆటవెలది,
కందము, సీసము

Second Language
HINDI

B.A. (First Year)

Paper - I
Gadya Sandesh
Katha Lok

B.A. (Second Year)
Paper - II
Kavya Deep

Modern Language

B.A. Modern Language (First Year)
Paper - I
Prose & Drama

B.A. Modern Language (Second Year)
Paper - II
Ancient Poetry &
Modern Khand Kavya & Poetics

B.A. Modern language (Third Year)
Paper - III :
Modern Prose

Paper - IV :
History of Hindi Literature
Principles of Literary Criticism and
Literary Essays

DEPARTMENT OF HINDI, U.G.

FIRST YEAR

PAPER - I

Name of the book : **गद्य संदेश;**   **Publisher - Larven publications**

1. साहित्य की महत्ता   महावीर प्रसाद द्विवेदी
2. सच्ची वीरता   सारदार पूर्ण सिंह
3. मित्रता   आचार्य रामचन्द्र शुक्ल
4. पूस की रात   प्रेमचंद
5. वही की वही बात   रमेश बख्शी
6. पृथ्वीराज की आँखे   डॉ. रामकुमार वर्मा
7. संस्कृति और साहित्य का परस्पर
   संबंध   डॉ.जी.सुंदर रेड्डी
8. बिंदा   महादेवि वर्मा
9. भारत एक है   रामधारी सिंह दिनकर
10. एच.आई.वी./एड्स   मूल लेखकः डॉ.प्रकाश भातबंडे
                                   डॉ. रमण गंगा

                                   अनुवाद. श्रीमती साधना मौर्य.

Name of the book : **कथा लोक;**   **Publisher - Sudha publications**

1. मुक्ति - धन   मुन्शी प्रेमचंद
2. गूदड साई   जयशंकर प्रसाद
3. उसने कहा था   चन्द्रधर शर्मा गुलेरी
4. ठेस   फणीश्वरनाथ 'रेणु'
5. मैं हार गई   मन्नू भण्डारी
6. भग्नावशेष   सुभद्राकुमारी चौहान
7. और वह पढ गई   डॉ. कुसुम वियोगी

I Year the following lessons were Deleted

Name of the book : **गद्य संदेश;**   **Publisher - Larven publications**

*1. आम फिर बौरा गये   आचार्य हज़ारी प्रसाद द्विवेदी
*2. बेईमानी की परत   हरिशंकर परसाई

Name of the book **कथा लोक;**   **Publisher - Sudha publications**

*1. ज़रिया   चित्रा मुद्गल
*2. भूख हडताल   श्री बालशौरि रेड्डी
*3. परमात्मा कुत्ता   मोहन राकेश

SECOND YEAR

PAPER - II

Name of the Book : काव्य दीप

Old Poetry

1. साखी - कबीरदास
2. विनय के पद

   बाल वर्णन - सूरदास

   वियोग वर्णन
3. दोहे - तुलसीदास
4. पद - मीराबाई
5. दोहे - रहीम
6. दोहे - बिहार

Modern Poetry

1. मातृभाषा के प्रति   -   भातेन्दु हरिशचन्द्र
2. मातृ-भूमि   -   मैथिलीशरण गुप्त
3. अशोक की चिन्ता   -   जयशंकर प्रसाद
4. भारतमाता   -   सुमित्रानंदन पंत
5. तोडती पत्थर   -   सूर्यकांत त्रिपाठी निराला
6. मै नीर भरी दुख की बदली -   महादेवी वर्मा
7. परिचय   -   रामधारी सिंह दिनकर
8. यह दीप अकेला   -   अज्ञेय
9. भूल गलती   -   गजानन माधव मुक्तिबोध
10. गीत-फरोश   -   भवानी प्रसाद मिश्र
11. ठूँठ   -   आलुरि बैरागी चौधरी
12. बस ! बहुत हो चुका   -   ओम प्रकाश वाल्मीकि
13. मादा-भ्रूण   -   रजनी तिलक

II Year, the following Lessons were Deleted

Name of the Book : **काव्य दीप**   Publisher: **Maruthi Publications**

Old Poetry	**Modern Poetry**
1. कबीरदास - 11 to 19	1. अशोक की चिन्ता - जयशंकर प्रसाद
2. सूरदास - वियोग वर्णन	2. परिचय - रामधारी सिंह दिनकर
3. मीराबाई 3 & 5	3. यह दीप अकेला - अज्ञेय
	4. भूल-गलती - गजानन माधव मुक्तिबोध
	5. गीत-फरोश - भवानी प्रसाद मिश्र

Second Language
SANSKRIT

1. **B.A. (First Year)**

   Paper - I

2. **B.A. (Second Year)**

   Paper - II

1. **B.A. Modern Language (First Year)**

   Paper - I

2. **B.A. Modern Language (Second Year)**

   Paper - II

3. **B.A. Modern language (Third Year)**

   Paper - III :

   Paper - IV :

SECOND LANGUAGE
SANSKRIT

FIRST YEAR

POETRY :

Lesson No. 1   Saranagathi
From Valmiki Ramayanam Yuddhakanda
17th Canto Slokas 11 -68

Lesson No. 2   Ahimsa Paramodharmah
From Srimadbharatam Adiparva 8th Chapter
Sloka 10 to the end of 11 Chapter

Lesson No. 3   Raghoh Audaryam
From Raghuvamsa 5th Canto 1-35 Slokas

Lesson No. 4   Modern Poetry : Mathrudesasya Aujvalyam
By Dr. G.S.R. Krishna Murthy

PROSE :

Lesson No. 5   Mitrasamprapthi
From Pancatantra - 1st Story (Abridged)

Lesson No. 6   Modern Prose Chikroda Katha
Andhra Kavya Kathah
By Sannidhanam Suryanarayana Sastry

Lesson No. 7   Computer Yanthram
By Prof. K.V. Ramakrishnamacharyulu

GRAMMAR
DECLENSIONS:

Nouns ending in Vowels:

Deva, Kavi, Bhanu Dhatru, Pitru, Go, Rama, Mati, Nadee, Tanu, Vadhoo, Matr, Phala, Vari   & Madhu

SANDHI:

Swara Sandhi	:	Savarnadeergha, Ayavayava, Guna, Vriddhi, Yanadesa
Vyanjana Sandhi	:	Scutva, Stutva, Vitva, Anunasika, Latva, Jastva

SAMASA :

(1)	Dwandwa	(2)	Tatpurusha (Common)
(2a)	Karmadharaya	(2b)	Dwigu
(2c)	Paradi Tatpurusha	(2d)	Gatitatpurusha
(2e)	Upapada Tatpurusha	(3)	Bahuvrihi
(4)	Avyayibhava		

CONJUGATONS

1st Conjugations - Bhoo, Gam, Shtha, Drhs Labh, Mud,

IInd Conjugation — As   (   )

IIIrd Conjugation - Yudh,

IVth Conjugation - Ish

VIII Conjugation - Likh, Kri   (   )

IXth Conjugation - Kreen   (   )

Xth Conjugation - Kath, Bhash, Ram, Vand,

II YEAR

(1)	Drama	(2)	Drama (Modern)
(3)	Upanishad	(4)	Prose
(5)	Bhoja Prabandha story	(6)	History of Literature
(7)	Alankaras	(8)	Grammar

DRAMA

1) Pratima Gruham
   Pratima of Bhasa III act only

2) Modern Drama
   Bharata Samskrutehe mulam
   P. Sreeramachandrudu from (Susamhata Bharatam VI act)

3) Upanisadadesah

Bruhadaranayaka	Dakara katha
Sikshanusasanam	Sikshavalli of Taittiriya

PROSE

4) Sukanasopadesah
From Kadambari Sangraha

5) Bhojasya Saraswati Sushama
From Bhojaprabandha Page No. 74 (Abridged form)

6) Poets and Books from History of literature

   l) Panini   (2) Kautilya
   3) Bharatamuni   (4) Bharavi
   5) Magha   (6) Sri Harsha
   7) Bhavabhuti   (8) Sankaracharya
   9) Dandin   (10) Jagannadha

7) Alankaras from Kuvalayananda

   (1) Upama   (2) Ananvayaa
   (3) Utpreksha   (4) Deepakam
   (5) Aprastutaprasamsa (6) Drstantam
   (7) Arthantaranyasa   (8) Virodha Bhasa
   (9) Ullekha   (10) Vyajasthuti

8) Grammar Declensions :

   Halanta Nouns
   (1) Jalamuc   (2) Vac
   (3) Marut   (4) Bhagavat
   (5) Pachat   (6) Rajan
   (7) Gunin   (8) Naman
   (9) Vidwas   (10) Manas

Pronouns:

   Asmad, Yushmad, Idam, Tat, Etat, Yat, Kim

Participles :

   Ktva, Lyap, tumun, Kta. Ktavat, Shatr, Shanac, Tavya

Second Language
URDU

1.   B.A. E/M & T/M (First Year)

1. Poetry : a) Ghazals, b) Nazams
2. Prose : i) Essays,   ii) Drama   iii) Safarnama

2.   B.A. E/M & T/M (Second Year)

1. Poetry : Nzams
i) Masnavi,   ii) Qaseeda,   iii) Masriya,
iv) Rubayath,   v) Qitaath

2. Prose :
i) Dastan,   ii) Novel, iii) Inshaiya,
iv) Khutooth v) Essay

3. Translation :
From English to Urdu

SECOND LANGUAGE
URDU

FIRST YEAR

PART - I

New Text Book entitled "MUTALIYA-E-ADAB" consists of (i) Ghazals (ii) Nazams (iii) Essays

1. Ghazals and Nazams

a) Ghazals of the following poets:

(i) Mohammed Quli	(a)	suno Aqilan sab keduniya haifani
	(b)	meri saoli mann ki piyari lage
(ii) Siraj	(a)	mujhko ekdam ghar hai hargiz
	(b)	jo tere gham ki tammanna na kiya
(iii) Meer Taqui Meer,	(a)	koi nahi jahan mein jo
	(b)	ham sey tuk age zamaney mey kia kia
(iv) Ghalib	(a)	koi din ger zindagi aur hai
	(b)	kisi ko deke dil koi nawa sanj-e-fugan kyu ho
(v) Hali	(a)	mujh men wo taab zabt-e-shikayath kahan
	(b)	dekha na har taraf na majlis men
(vi) Maqdoom	(a)	ap ki yaad ati rahi rath bhar
	(b)	zindagi mothiyoin ki dhalakthi ladi zindagi rang gul ka bayan dosto

b) Nazams of the following poets:-

(i) "TAWHEED"Nazeer Akbar Abadi

(ii) "MUSHTAQBIL" Akbar ilahbadi

(iii) "FUNUN-E-LATIFA" Iqbal

(iv) "PREETH KA GEETH" Hafeez Jalandhari

(v) "AIY-SHAREEFINSANON" Saher Ludhiyanvi

(vi) "ABKY BARAS" Shaz tamkanath.

2. PROSE

Essays of the following writers

(i) "TALASH"by Imtiyaz Ali Taj

(ii) "HINDUSTAN JANNATH NASHAN" by Saleha Abid Hussain

(iii) "PADIYE-GAR BEEMAR" by Mushtaq Ahmed yousufi

(iv) "YEH GHAZI YEH TERY PUR ASRAR BANDE" by Quratulain Hyder

(v) "SULEMAN AREEB" by Mujtaba Hussain

SECOND YEAR
PAPER-II

Text Book "MUTALIYA-E-ADAB" compiled by the Dept of Urdu OU and publish by AP Urdu academy consists of the following :

I. POETRY:

a) Nazams of the following poets:-

I) Masnavi :AMANNAMA" by Jan Nisar Akthar (a portion)

II) Qaseeda "DER SHAAN-E-HAMEEDUD DAULA" by Zaugh Dahelri

III) Marsiya "GARMI KA SAMAN" by Meer Anees

IV) Rubayath

    1) Hali   (i) Duniya-e-dani ko Naqsh-e-fani samjho
                   (ii) Yaro nahi waqt aram ka yeh

    2) Amjad   (i) Koshish hai apni tamam sitayash ke liy
                   (ii) kamzarfagar daulath-o-zar pata hai

V) Qitaath:-

    1) Akbar   (i) Chod Litereture ko apni history bhul ja
    2) Iqbal   (i) Andaz-e-Bayan gharch-e- bahoth shook nahi hai

II PROSE:

1) Dastan: "Intekhab-e-sabras" Mulla wajhi
2) Novel: "Nusuh aur saleem ki guftagu" Dipty Nazeer Ahmed
3) Inshaiya: "Zauq-e-chay nushi"Abul kalam Azad
4) Khutooth: "Maktubaat-e-safia "Safia Akhtar"
5) Essay: "Qadeem Urdu Naseeruddin Hashmi

III Translation : From English to Urdu

PART - II
B.A.

B.A. MODERN LANGUAGE (English)

FIRST YEAR

PAPER - I

UNIT - I : Language and Literature

(a)   A Brief History of the English Language

Indo-European Family of Languages, Descent of English, Foreign Influences :

(Latin, French, Greek), Word-formation, Semantics

Suggested Books :

FT Wood: *An Outline History of the English language*
T. Vinoda: *A Short History of English Language*
C.L. Barbara: *The Story of Language*
R.N. Roy : *History of English Language*

(b)   (Understanding/Comprehension)

i) of a literary prose passage
ii) of a poem

Unit - II : Forms of Poetry : Evolution, Kinds and Variations

Sonnet : Shakespeare, Sonnet No. 116 ('Let me not to the...')
Ode : Keats, "Ode to the Nightingale"
Lyric : Wordsworth, "Education of Nature"
Dramatic Monologue : Browning, "Last Ride Together"
Elegy : Gray, "Elegy Written in a Country Churchyard"

Unit - III : Introduction to the Study of Drama :

Drama and the Novel, Different types of Drama, Plot.
Natural Divisions of a Dramatic Plot, Characterisation, Dialogue

Unit - IV : Introduction to the Study of Fiction :

Plot, Characterisation, Point of view, Setting/Atmosphere, Style/ Narrative, Techniques, Truth in Fiction

Suggested Books :

M.H. Abrams : *A Glossary of Literary Terms*
W.H. Hudson : *Introduction to the Study of Literature* (New Delhi: Kalyani Publishers, 1979)

SECOND YEAR
PAPER - II

UNIT - I : Origin and Development from Chaucer to Romantic Age

George Herbert : "Virtue"
William Blake : "A Poison Tree"
William Wordsworth : "Simon Lee"
Alfred Lord Tennyson : "Ulysses"
Rabindranath Tagore : "From Lover's Gift"

(From LSR Krishna Sastry, ed. *Magic of the Muse* (Hyderabad: Maruthi Publishing House)

Unit - II : Drama : Origin and Development

William Shakespeare : *The Tempest*

Unit - III : Origin and Development

Francis Bacon : "Of Studies"
Charles Lamb : "Dream Children - A Reverie"
George Orwell : "Politics and the English Language"
R.K. Narayan : "Next Sunday"

Unit - IV : Fiction: Origin and Development

Jane Austen: *Pride and Prejudice*

Suggested Books :

M.H. Abrams : *A Glossary of Literary Terms*

W.H. Hudson : *Introduction to the Study of Literature* (New Delhi: Kalyani Publishers, 1979)

FINAL YEAR
PAPER - III : INDIAN WRITING IN ENGLISH

UNIT - I : Poetry

A.K. Ramanujan: "Small-Scale Reflections on a Great House", "A River", "Obituary".

Nissim Ezekiel : "Night of the Scorpion", "Poet, Lover and Bird Watcher" "Goodbye Party to Miss Pushpa TS"

Kamala Das : "An Introduction", "Composition", "A Hot Noon in Malabar"

Unit - II : Fiction

R.K. Narayan : The Guide
Manohar Malgonkar : A Bend in the Ganges

Unit - III : Drama

Mahaswetha Devi : *Mother of 1084*
Girish Karnad : *Hayavadana*

Unit - IV : Prose

Jawaharlal Nehru, *Discovery of India* (Chapter III "The Quest" only)

APJ Abdul Kalam, *Ignited Minds* (Chapter II: "Give Us a Role Model", Chapter VI: "The Knowledge Society", Chapter IX : "To My Countrymen" only)

PAPER - IV : LITERARY CRITICISM

UNIT - I : Phases of Literary Criticism

Renaissance Criticism, Neo-classical Criticism, Romantic Criticism, Victorian Criticism, New Criticism

Unit - II : Philip Sidney : *An Apologie for Poetry* (On Superiority of Poetry over other Disciplines)

John Dryden : *An Essay on Dramatic Poesy* (On Ancient vs Moderns)

Unit - III : Samuel Johnson : *Preface to Shakespeare* (On Merits and Demerits of Shakespeare)

Matthew Arnold : *The Study of Poetry*

Unit - V : T.S. Eliot : "Function of Criticism"

I.A. Richards : "Four Kinds of Meaning"

MODERN LANGUAGE
TELUGU
FIRST YEAR

PAPER - I

ఎ. ప్రాచీన కవిత్వం

1. ఉత్తర గోగ్రహణము – తిక్కన
   శ్రీమదాంధ్ర మహాభారతము, విరాటపర్వము, చతుర్థాశ్వాసము 4 నుండి
   50 వరకు

2. శుచిముఖి చాతుర్యము – పింగళి సూరన
   ప్రభావతి ప్రద్యుమ్నము, చతుర్థాశ్వాసము 39 నుండి 88 వరకు

3. ఆంధ్రనాయక శతకము – కాసుల పురుషోత్తమ కవి

బి. ఆధునిక కవిత్వం

1. కడపటి వీడ్కోలు   –   దువ్వూరి రామిరెడ్డి
2. రుద్రవీణ   –   దాశరథి
3. కవితా! ఓ కవితా   –   మహాప్రస్థానము – శ్రీశ్రీ

గద్యభాగము

1. గాలివాన (కథ) – పాలగుమ్మి పద్మరాజు

2. తిండిదొంగ (కథ) – కొడవటిగంటి కుటుంబరావు
   (కుటుంబరావు సాహిత్యం – నాలుగవ సంపుటం)

3. మహాభారత పరమార్థం – సుప్రసన్న
   (సమర్చన – వ్యాససంకలనం నుండి)

4. కాకతీయుల భాసా సాహిత్య సేవ – పేర్వారం జగన్నాథం
   (సాహితీ వసంతం నుండి)

ఛందస్సు

1. దశవిధ యతులు

2. షడ్విధప్రాసలు

36

3. అలంకారములు : (ఆంధ్ర చంద్రాలోకము నుండి)

ఉపమ, ఉత్ప్రేక్ష, రూపక, అర్థాంతరన్యాస, అతిశయోక్తి, దృష్టాంత, ఉల్లేఖ, శ్లేష, అనుప్రాస, యమకం

SECOND YEAR

PAPER - II

ఎ. తెలుగు సాహిత్య చరిత్ర

1. ఎ) ప్రాఙ్నన్నయ యుగం : సాహిత్య వికాసం
   బి) కవిత్రయము : నన్నయ, తిక్కన, ఎఱ్ఱన

2. శివ కవియుగము : నన్నెచోడుడు, పండితారాధ్యుడు, పాల్కురికి సోమన

3. శ్రీనాథయుగము : శ్రీనాథుడు, పోతన

4. పదసాహిత్యం : అన్నమయ్య, క్షేత్రయ్య, త్యాగయ్య

5. ప్రబంధ యుగము : ప్రబంధ లక్షణాలు – పెద్దన్న, తిమ్మన్న, శ్రీకృష్ణదేవరాయలు, ధూర్జటి, రామరాజ భూషణుడు, పింగళి సూరన

6. నాయక రాజులు పాలనము – సాహిత్యం : యక్షగానములు, వచన కావ్యములు, శతకములు, చేమకూర వేంకట కవి

బి – భాగము

అనువాద నాటకం – స్వప్నవాసవదత్త – అనువాదము

(చిలకమర్తి లక్ష్మీనరసింహం)

ఆధార గ్రంథాలు :

1. ఆంధ్రకవితరంగిణి – చాగంటి శేషయ్య
2. ఆంధ్ర వాఙ్మయచరిత్రం – దివాకర్ల వేంకటవధాని
3. ఆంధ్ర సాహిత్య చరిత్ర – పింగళి లక్ష్మీకాంతం
4. సమగ్రాంధ్ర సాహిత్యం – ఆరుద్ర
5. తెలుగు సాహిత్య చరిత్ర – కొర్లపాటి శ్రీరామమూర్తి
6. ఆరుయుగాల ఆంధ్ర కవిత – ఇంద్రగంటి హనుమచ్ఛాస్త్రి

THIRD YEAR

PAPER - III

ఎ. భాగం : భాషా సాహిత్య చరిత్ర – వ్యాకరణం

1. ప్రాజ్ఞన్నయ యుగంలోని శాసనాల్లో తెలుగు భాషా స్వరూపం

2. ఆంధ్రము – తెలుగు – తెనుగు – పదాల చరిత్ర

3. ద్రావిడ భాషలలో తెలుగునకు గల స్థానం

4. తెలుగు విభక్తి విధానం

5. సంఖ్యా వాచకాలు

6. అర్థ విపరిణామం

7. మాండలికాలు

బి. భాగం : వ్యాకరణం

1. సంజ్ఞా పరిచ్చేదం – బాల వ్యాకరణం – చిన్నయ సూరి

2. సంధి పరిచ్చేదం – బాల వ్యాకరణం – చిన్నయ సూరి

ఉపయుక్త గ్రంథాలు :

1. ఆంధ్ర భాషా వికాసము – గంటి జోగి సోమయాజి

2. తెలుగు భాషా చరిత్ర – భద్రి రాజు కృష్ణమూర్తి (సంపాదకుడు)

3. ఆంధ్ర భాషాచరిత్రము – 1,2 సంపుటాలు – చిలుకూరి నారాయణరావు

4. మాండలిక వృత్తి పదకోశం – భద్రిరాజు కృష్ణమూర్తి (పీఠిక)

5. తెలుగు శబ్దపరిణామం – హెచ్.యస్. బ్రహ్మానంద

6. బాలవ్యాకరణం – దువ్వూరి వెంకటరామణశాస్త్రి

7. బాల వ్యాకరణం : ఘంటా పథ వ్యాఖ్యాన సహితం – వంతరాం రామకృష్ణారావు

PAPER - IV
కావ్య శాస్త్ర పరిచయం

1. కావ్యము – కావ్య నిర్వచనాలు – ప్రాచ్య పాశ్చాత్య దృకృథాలు

2. కావ్య భేదాలు – కావ్య హేతువులు – ప్రతిభ – వ్యుత్పత్తి – అభ్యాసాలు

3. కావ్యము – శాస్త్రము

4. కావ్య ప్రయోజనాలు

5. దశగుణాలు – మూడు రీతులు

6. రస స్వరూపము – రస సూత్రము – స్థాయా భావాలు

7. రస సంఖ్య – నవరసములు – రస సమీకరణము

8. అభిధ – లక్షణ – వ్యంజన

9. విమర్శ నిర్వచనం – స్వరూప స్వభావాలు

ఉపయుక్త గ్రంథాలు :

1. సాహిత్య శిల్ప సమీక్ష – ఆచార్య పింగళి లక్ష్మీకాంతం

2. సాహిత్య సోపానములు – దివాకర్ల వేంకటావధాని

3. సాహిత్య సౌందర్య దర్శనం – చర్ల గణపతి శాస్త్రి

4. సాహిత్య దర్శనం – ఆచార్య కె.వి.ఆర్. నరసింహం

5. కావ్యాలంకార సంగ్రహం – సన్నిధానం సూర్య నారాయణశాస్త్రి

MODERN LANGUAGE HINDI

PAPER - I

PROSE AND DRAMA :

1. **गद्य के नए आयाम :** Published by Peetambar, Delhi
   गुंगिया, बरगद, यात्रा का अंत, देवी अहल्याबाई.

2. **प्रतिनिधि एकांकी :** Published by Peetambar, Delhi
   दिपदान, वापसी, जोंक, भोर का तारा

3. **ध्रुवस्वामिनी :** जयशंकर प्रसाद

4. निर्मला : प्रेमचंद

PAPER - II

I. ANCIENT POETRY & MODERN KHAND KAVYA & POETICS

Books Prescribed :

1. **मध्ययुगीन काव्य :** Edited by Dr. Brinjnarayana Singh, Published by National Publishers, Delhi.

2. **प्रार्थना पुरुष-नरेश महता :** Published by National Publishers, Delhi.

II. INDIAN POETICS

Portion Prescribed :

अलंकार : (8)

| 1 अनुप्रास | 2. यमक | 3. श्लेष | 4. वक्रोक्ति |
| 5. उपमा | 6. रूपक | 7. अतिशयोक्ति | 8. विरोधाभास |

III. तीन शब्द शक्तियाँ और नवरस

IV. छंद :(8)

| 1. दोहा | 2. सोरठा | 3. चौपाई | 4. रोला |
| 5. हरिगीतिका | 6. गीतिका | 7. मंदाकिनी | 8. शिखरिणि |

Books Prescribed :

1. Kavya pradeep: By Ram Bihari Shukla, Allahabad.
2. Ras Chand: Alankar by Shambhunath Pandey, published by Vinod pustak Bhandar, Agra.

PAPER - III
MODERN PROSE

Triveni : Acharya Ramchandra Shukla, Mallik Mohd. Jayasi, Susrdas, Tulsidar.

Books prescribed for detailed Study.

TRIVENI : by Acharya Ramchandra shukla, published by Nagari Pracharini Sabha of Varanasi, Annotations from the above book poets are to be given from the poems quoted TRIVENI.

Modern Poetry :

KAVYAKSHAT : Edited by Devenchcha, Published by Rajpal & Son's, New Delhi.

1. Jayshankar Prasad -
2. Suryakanth Tripati Nirala -
3. Sumithranandan Panth
4. Mahadevi Varma
5. Agnyay -

Books Prescribed for Detailed study :

One Essay Question and one annotation Question from Ancient poetry, out of four two annotations are to be answered. Three essay Questions from Modern Poetry

PAPER - IV
HISTORY OF HINDI LITERATURE:
Principles of Literary Criticism and Literary Essay

a) History of Hindi Literature
b) Principles of Literary Criticism
c) Literary Essay

A. General Introduction of all the four ages and representatives. Poets and Writings of these Ages.

B. 1. Alochana ke Siddhanth
   2. Alochana ki Paribhasha - Swarup - Prakar
   3. Alochana ke Dayitv

C. Literary Essay

B.A.

GENERAL STREAM WITH NO COMPUTER COURSE AS CORE SUBJECT

B.A. FIRST YEAR

THEORY PAPER - I
INTRODUCTION TO COMPUTERS

UNIT - I : Exploring Computers

Exploring Computers and their uses :

Overview: Computers in our world. The computer defined. Computers for individual users.Computers for organizations. Computers in society. Why are computers so important.

Looking inside the computer system:

Overview : Detecting the ultimate machine. The parts of a computer system. The information processing cycle, Essential computer hardware: Processing devices, Memory devices, Input and output devices. Storage devices, System software. Application software, Computer data, Computer users.

Using the keyboard and mouse:

Overview : The keyboard and mouse, The keyboard. How the computer accepts input from the keyboard. The mouse, Variants of the mouse. Ergonomics and input devices.

Inputting data in other ways :

Overview : Options for every need and preference. Devices for hand, Optical input devices, Audio-visual input devices.

Video and Sound :

Overview: Reaching our senses with sight and sound. Monitors, Ergonomics and monitors, Data projectors, Sound systems.

UNIT – 2 : Storage Devices and Operating System Basics

Printing :

Overview: putting digital content in your hands, Commonly used printers, High-quality printers, Thermal-wax printers, Dye-sublimation printers, Plotters.

Transforming data in information :

Overview : The difference between data and information. How computers represent data, How computers process data, Machine cycles, Memory, Factors effecting processing speed, The computer's internal clock, The Bus, Cache memory.

Types of storage devices :

Overview: An ever-growing need, Categorizing storage devices, Magnetic storage devices—How data is stored on a disk, How data is organized on a magnetic disk, How the operating system finds data on a disk, Diskettes, hard disks, Removable high-capacity magnetic disks, Tape drivers, Optical storage devices, Solid-state storage devices, Smart cards, Solid-state disks.

Operating system basics :

Overview : The purpose of operating systems, Types of operating systems, Providing a user interface, Running programs, Managing hardware, Enhancing an OS utility software.

Networking Basics :

Overview: Sharing data anywhere, anytime. The uses of a network, Common types of networks, Hybrid networks, How networks are structured. Network topologies and protocols, Network media. Network hardware.

UNIT – 3 : Data Communication and Computer Programs

Data Communications :

Overview : The local and global reach of networks, Data communications with standard telephone lines and modems, Modems, uses of a modem, Using digital data connection Broad band connections, Wireless networks.

Productivity Software :

Overview : Software to accomplish the work of life, Acquiring software, commercial software, Freeware and public domain software. Open-source software, World processing programs, Spreadsheet programs, Presentation programs, Presenting information managers.

Database management Systems :

Overview : The mother of all computer applications, Databases and

Database Management Systems, Working with a database.

Creating Computer programs :

Overview : What is a computer program. Hardware interaction, Code, machine code, programming languages, Compilers and interpreters, Planning a computer program, How programs solve problems.

Programming languages and the programming process :

Overview : The keys to successful programming. The evolution of programming language. Word wide web development languages. The Systems development life cycle for programming.

UNIT - 4 : MS-Word

Word Basics : Starting word, Creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Formatting Text and Documents : Auto format, Line spacing, Margins, Borders and Shading.

Headers and Footers : Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

Tables : Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting a table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width.

Graphics : Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates : Template types, using templates, exploring templates, modifying templates.

Macro : Macro, Record in a macros, editing macros, running a macro.

Mail Merge : Mail Merge concept, Main document, data sources, merging data sources and main document, Overview of word menu options word basic tool bar.

UNIT - 5 : Ms-Power Point

Power Point : Basis, Terminology, Getting started, Views.

Creating Presentations : Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

Prescribed Books :

1. Peter Norton, Introduction to Computers, Sixth Edition, Tata McGraw Hill (2007) (Chapters 1, 2, 3, 4, 5, 6, 7, 10, 11, 12)

2. Ran Mansfield, working in Microsoft Office, Tata McGraw Hill (2008) (Chapters 4 to 9, 11, 12, 24, 25, 28)

Reference Books :

1. Michael Miller, Absolute Beginner's guide to computer Basics, Fourth Edition, Pearson Education (2007)

2. Deborah Morley, Charles S. Parker, understanding computers today and tomorrow, 11th edition, Thomson (2007).

3. Ed Bott, woody Leonhard, using Microsoft Office 2007, Pearson Education (2007).

B.A.

GENERAL STREAM WITH NO COMPUTER COURSE AS CORE SUBJECT

B.A. SECOND YEAR
OFFICE AUTOMATION TOOLS

UNIT - 1

Excel basics : The usual spread sheet features, Overview of excel features, Getting Started, Creating a new work sheet, Selecting cells, Navigating with the mouse and keyboard, Entering and editing text, text boxes, text notes, checking spelling, undoing and repeating actions, entering and formatting numbers, entering and editing formulas, referencing cells, order of evaluation in formulas, look up tables, copying entries and equations to minimize typing, more auto fill examples, creating custom fill lists, protecting and unprotecting documents and cells.

Rearranging worksheets : Moving cells, copying cells, sorting cell data, inserting rows, inserting columns, inserting cells, inserting as you paste, deleting parts of a worksheet, clearing parts of a worksheet, how formulas react to worksheet design changes, Auditing tools help spot potential problems.

Excel formatting tips and techniques : Excel page setup, Changing column widths and row heights, auto format, manual formatting, using styles, format codes alter a number's appearance, format painter speeds up format copying, changing font sizes and attributes, adjusting alignments, centering text across columns, using border buttons and commands, changing colors and shading, inserting and removing page breaks, hiding rows and columns.

Organizing large projects : Using names, splitting windows and fixing titles, outlining your worksheets, working with multiple worksheets, using multiple worksheets in a workbook, viewing multiple windows, summarizing information from multiple worksheets.

An introduction to functions : Parts of a function, functions requiring add-ins, online functions help, the function wizard, examples of functions by category, error messages from functions.

UNIT - 2

Excel's chart features : chart parts and terminology, instant charts with the chart wizard, creating charts on separate worksheets, resizing and moving charts, adding chart notes and arrows, editing charts, rotating 3-D charts, Changing worksheet values by dragging chart parts, printing charts, deleting charts, setting the default chart type, controlling with series on which axis, adding overlay charts, creating trend lines, data map.

Working with graphics in Excel : Creating and placing graphic objects, resizing graphics, positioning graphics on worksheets, drawing lines and shapes, examples of graphics in Excel, possible sources of excel graphics, Excel slide shows.

Introduction to Excel's command macros : Recording your own macros, running macros, assigning macros to buttons.

Using worksheets as databases : Database concepts and terms, Creating an excel database, Working with data forms, filtering-a better way to find, sorting excel databases, cross-tabulating databases, adding subtotals to databases.

Automating what-if projects : General organizational tips, scenario manager, finding the right number with solver.

Auditing and trouble shooting worksheets : Using error values to locate problems, using iteration to solve circular references, using the info window to find errors, using the auditing command to trouble shoot.

UNIT - 3

Introduction to Access : Access concepts and terms, starting and quitting access, the access workspace and tools, the views.

Creating a simple database and tables : The access table wizard, creating databases without the wizard, field names, data types and properties, adding or deleting fields in tables, renaming fields and their captions, moving fields, deleting fields in tables, resizing fields, changing the appearance' of text in tables, freezing columns, primary key fields, indexing fields, viewing a list of database properties.

Forms : The form wizard, saving forms, modifying forms.

Entering and editing data : Typing, adding records, duplicate previous entries without retyping, switching out of data entry mode, when do entries get saved?, undo, correcting entries, global replacements, moving from record to record in a table, entry and navigational shortcuts.

Finding, sorting and displaying data : Queries and dynasets, creating and using select queries, returning to the query design, multiple search criteria, finding incomplete matches, using wildcards in queries, requesting range of records, hiding columns, reformatting dynasets, multilevel sorts, showing all records after a query, saving queries for latter use, cross tab queries, find and replace.

UNIT - 4

Printing reports, forms, letters and labels: simple table, form, and database printing, defining advanced reports, manual reporting and modifying, modifying section contents, properties in reports, saving report formats for reuse, printing mailing labels, changing label designs.

Relational databases : Flat versus relational, how relationships work, Exercise: creating a simple relationship, types of relationships, defining and redefining relationships, deleting relationships, creating relationships.

Expressions, macros and other automation : Expressions, using expressions in reports, using expressions in queries, using expressions in forms, expression builders.

Graphics in databases : Objects: linked, embedded, bound and unbound, unbound graphics as form and report embellishments, bound graphics in records, adding graphics to buttons, chart wizard: charting your data.

Linking, importing and exporting records : Importing versus linking, linking other databases as tables, importing data from spread sheet files, importing data from word files, exporting access data.

Unit - 5

The Internet and the World Wide Web : Overview: what is Internet, The Internet's history, The Internet's major services, Understanding the world wide web, Using your browser and the

world wide web, navigating the web, closing your browser, getting help with your browser, searching the web, search results and web sites .

E-mail and other Internet Services : Overview: communicating through the Internet, Using E-mail, Using an E-mail program, Stoping out spam, Using web-based e-mail services, More features of the Internet.

Connecting to the Internet: Overview: Joining the Internet phenomenon, Connecting to the Internet through wires, How PC applications access the Internet, Connecting to the Internet wirelessly.

Doing business in the online world : Overview: commerce on the world wide web, E-commerce at the consumer level, E-conmerce at the business level, Business, the Internet and every thing, Telecommuters.

Prescribed books:

1.   Ron Mansfiled, Working in Microsoft office, Tata McGraw Hill (2008) (chapters 13 to 23 and 29 to 38)

2.   Peter Norton, Introduction to computers, Sixth Edition Tata McGraw Hill (2007) (Chapters 8A, 8B, 9A, 9B) .

Reference Books :

1.   Michael Miller, Absolute Beginner's guide to computer Basics, Fourth Edition, Pearson Education (2007).

2.   Deborah Morley, Charles S.Parker, understanding computers today and tomorrow, 11th edition, Thomson (2007).

3.   Ed Bott, woody Leonhard, using Microsoft Office 2007, Pearson Education (2007).

4.   Rajkamal, Internet and web Technologies, Tata McGraw Hill (2007) .

B.A.
PUBLIC ADMINISTRATION

FIRST YEAR

PAPER - I   :   Introduction to Public Administration

SECOND YEAR

PAPER - II   **:**   Public Administration in India

THIRD YEAR

PAPER - III   **:**   Management of Resources

PAPER - IV   **:**   **Optionals**

      (a)   Office Management

      (b)   E-Governance

      (c)   Rural and Urban Governance in India

PUBLIC ADMINISTRATION
FIRST YEAR

PAPER - I
INTRODUCTION TO PUBLIC ADMINISTRATION

BLOCK - I : Introduction

1. Meaning, Nature, Scope and importance of Public Administration

2. State and Evolution of Public Administration

3. Relationships with other Social Sciences: With special reference to Political Science, Economics, Sociology, Psychology

4. Politics & Administration Dichotomy - Woodrow Wilson and F.J. Goodknow

BLOCK - II : Theories and Approaches

5. Classical Approach : Henry Fayol, Gulick and Urwick

6. Scientific Management Approach: Taylor

7. Bureaucratic Approach: Max Weber and Karl Marx

8. Human Relations Approach - Elton Mayo

9. Behavioural Approach: Herbert A. Simon

10. Socio - Psychological Approach: Hierarchy of Needs : Abraham Maslow; Theory X and Theory Y : Douglas Mc Gregor

11. Ecological Approach: Riggs

BLOCK - III: Concepts and Principles of Public Administration

12. Administrative Planning

13. Leadership and Supervision

14. Communication and Public Relations

Block IV: Emerging Trends

15. New Public Administration : Minnowbrook I & II

16. Public Administration and Public Policy

17. New Public Management

18. Governance

19. Public Administration in the context of Globalization, Privatization and Liberalization

20. Post Modem Public Administration

PAPER – II
PUBLIC ADMINISTRATION IN INDIA

BLOCK - I : Historical Background

1. Evolution of Indian Administration - Ancient, Medieval and British Periods -Continuity and Change in Indian Administration after Independence

2. Context of Indian Administration – Social, Economic and Political

BLOCK - II : Central Administration

3. Union Government and Administration - President, Prime Minister, Council of Ministers, Central Secretariat, Cabinet Secretariat, Cabinet Committees and Prime Minister Office

4. Union and State Relations and Agencies - Administrative Relations - Inter State Council, Finance Commission. All India Services, Planning Commission, National Development Council.

5. Public Enterprises in India: a) Forms of Public Enterprises: b) Privatization and Disinvestment

BLOCK - III: State and District Administration

6. State Government and Administration: Governor, Chief Minister, Council of Ministers, Secretariat *&* Directorates, General Administration Department and Chief Secretary

7. District Administration: Changing Role of District Collector, Mandal and Village Administration in Andhra Pradesh

8. Local Governments - Rural and Urban - Structure and functions – 73rd and 74th Constitutional amendments

BLOCK - IV: Administrative Accountability

9. Control over Administration :

    a. Legislative and Judicial Control
    b. Lok Pal, Lokayukta and Central Vigilance Commission
    c. Consumer Protection Forums
    d. Right to Information Act (RTI)
    e. National and State Human Rights Commissions

10. Administration of Welfare Programmes for Weaker Sections – SCs, STs, BCs, Women and Minorities

BLOCK - V : Emerging Issues

11. Administrative Reforms, Recommendations of important Commissions and Second ARC

12. Mechanisms for Disaster Management

13. Governance and e-Governance Applications in Indian Administration

14. Public Private Partnerships and Voluntary Sector

PAPER - III
MANAGEMENT OF RESOURCES

BLOCK - I : Human Resource Management

1. Meaning, Nature, Scope and Significance of Human Resource Management

2. Human Resource Strategy and Planning

3. Recruitment, Selection, Appointment and Promotion

4. Pay - Components, Principles of Pay & Pay Commissions

BLOCK - II : Capacity Building

5. Performance Appraisal — Rewards and Incentives Management

6. Human Resource Development — Concept of HRD; Training — Objectives, Types, Evaluation

7. Employee Capacity Building Strategies and Total Quality Management

8. Human Resource Management Effectiveness and Human Resource Audit

9. Issues in HRM - Downsizing, Outsourcing, Consultancies

Block - III : Financial Management

10. Meaning, Scope and Importance of Financial Management

11. Budget - Concept, Principles of Budgeting; Preparation, Enactment and Execution

12. Organization and functions of the Finance Ministry

13. Union - State Financial relations and the role of the Finance Commission

14. Parliamentary Financial Committees - Public Accounts Committee, Estimates Committee and Committee on Public Undertakings and Comptroller und Auditor General of India

BLOCK - IV: Materials Management

15. Procurement

16. Storage and Distribution

17. Logistics Management

PAPER - IV: (OPTIONAL):
(A) OFFICE MANAGEMENT

BLOCK - I: Introduction

1. Office Administration : Nature, Scope and Importance

2. Basic Principles of Office Organization

BLOCK - II : Office Organization and Management

3. Office Planning and Lay-out, Office Environment

4. Forms Management and Control

5. Filing System and Periodical Reports

6. Office Communication, Correspondence

7. Management of Office Records

8. Office Stationery

BLOCK - III : Office Management: Processes and Issues

9. Work Study, Work Measurement, Work Simplification.

10. Management by Objectives

11. Office Supervision

12. Staff Welfare

BLOCK - IV : Trends and Issues in Office Management

13. Office Automation and Paperless Office

14. Back Office Operations and Front Office Delivery

15. Social System and Public Office Administration

16. Office Management in Government : Issues

PAPER -IV: (OPTIONAL):
(B) E-GOVERNANCE

Introduction

1. Meaning, Definition and Importance of Electronic Governance

2. Evolution of E-Governance

3. Information Society and Community Empowerment

4. IT Act 2000 and National E-Governance Programme - 2002

5. Opportunities and Challenges for E-Governance in India

Techniques of e-Governance

6. G1S Based Management Systems

7. Citizen Database and Human Development

8. Back Office Operations and Front Office Delivery

9. Public Grievance Redressal Mechanisms

e-Governance : Case Studies

10. Akshaya Programme in Kerala

11. Bhoomi in Karnataka

12. Wired Village Project - Warana experiment in Maharashtra

e- Governance in Andhra Pradesh: Case Studies

13. Computer - Aided Administration of Registration Department (CARD)

14. E-Seva (Electronic Citizen Services)

15. Rural Kiosks

PAPER -IV: (OPTIONAL):
(C) Rural and Urban Governance in India

BLOCK - I : Concept of Democratic Decentralization

1. Local Government: Concept, Features and Importance.

2. Democratic Decentralization : Concept, Evolution and significance

3. Evolution of Local Government in India : Community Development Programme and National Extension Service

BLOCK - II : Rural Local Governance

4. Balwant Rai Mehta .and Ashok Mehta Committee Reports : Structures, Functions and Finances; Second generation and Third generation Panchayats

5. Reforms in Panchayat Raj - Features of 73rd CAA and Organizational structures for Panchayathi Raj

6. Intra - Rural Local Government relationships: Gram Sabha and Gram Panchayats; Distribution of Powers and Functions; Intra Tier responsibilities (The Eleventh Schedule)

BLOCK - III : Urban Governance

7. Urbanization in India and Policies and Strategies

8. Evolution of Urban Local Governments in India : Reforms in Urban Local Bodies - Features of 74th CAA

9. Urban Local Government - Structure, functions, officials, Committee System, Finances, Officials and Political executives (with special reference to Andhra Pradesh).

10. Municipal Corporations: Structure, Committee System, Finances, Officials and Political executives (with special reference in Andhra Pradesh).

11. Urban Development Authorities in Andhra Pradesh and their working

BLOCK - IV : Issues and Trends

12. State Control and Supervision over Local Bodies.

13. Micro planning and implementation, Social Audit. Capacity Building of Grassroots functionaries.

14. Parallel bodies and Voluntary Sector: Self Help Groups. Users Associations and Parastatals

15. Sustainable Development and Challenges to Decentralized Governance

B.A.
POLITICAL SCIENCE

FIRST YEAR

PAPER - I   :   Political Concepts, Theories and Institutions

SECOND YEAR

PAPER - II   **:**   Indian Government and Politics

THIRD YEAR

PAPER - III   **:**   Political Thought (Compulsory)

PAPER - IV   **:**   **Optionals**

       (a)   International Relations

       (b)   Government and Politics in Andhra Pradesh

       (c)   Principles of Public Administration

POLITICAL SCIENCE
FIRST YEAR

PAPER I
POLITICAL SCIENCE CONCEPTS, THEORIES AND INSTITUTIONS

1. Introduction: Definition, Scope and Importance of Political Science

2. Approaches to the Study of Political Science: Liberal and Marxist

3. State-Nation and Civil Society

4. Sovereignty: Monism and-Pluralism

5. Theories of Origin of the State: Social Contact and Evolutionary (Historical)

6. Concepts:
    a. Law: Sources of Law and Concepts of Rule of Law
    b. Liberty and Equality-Their Relationship
    c. Theories and kinds of Rights
    d. Power and Authority

7. Ideologies: Individualism, Anarchism, Fascism and Socialism .

8. Forms of Government:
    a. Democracy: Direct and Indirect
    b. Unitary and Federal
    c. Parliamentary and Presidential.

9. Theory of Separation of Powers

10. Organs of Government

    a) Legislature   :   i) Unicameral and Bi-cameral
                         ii) Powers and Functions
    b) Executive   :   i) Powers and Functions
    c) Judiciary   :   i) Powers and Functions
                         ii) Independence of Judiciary and Judicial Review

Books Recommended:
1. *Principles of Political Science :* A.C. Kapoor
2. *Grammar -of Polities:* Laski H.J.
3. *Substance of Politics :* A. Appadorai
4. *Political Theory :* Ashirvadam
5. *Political Theory:* O.P. Gauba
6. *Political Ideologies:* Their Origins and Impact, Baradat, Prentice Hall of India

PAPER - II
INDIAN GOVERNMENT AND POLITICS

1. Salient Features of Indian Constitution a Comparative Perspective with the Constitutions of UK, USA and Switzerland.

2. Evolutions of Indian Constitution - Nationalist Movement and Philosophical Foundations.

3. Indian Federation - Centre - State Relations - Recent Trends.

4. Fundamental Rights and Duties, Constitutional Remedies with special reference to Writs - Directive Principles of State Policy.

5. President - Election, Powers and Functions - Prime Minister and Council of Ministers.

6. Parliament - Composition, Powers and Functions.

7. Judiciary - Supreme Court, Composition, Powers, Functions and Judicial Review - Judicial Activism.

8. Party System: National and Regional Parties; Coalitional Politics.

9. Election Commission - Electoral Reforms and Voting Behaviour.

10. State Government - Governor, Chief Minister and Council of Ministers - Powers and Functions.

11. Social and Economic Factors- Language, Religion, Caste and Regional Identities.

12. Social Movements: Agrarian, Working Class, Women, Tribal, Dalit and Environmental.

13. Challenges to National Integration - Communalism and Terrorism.

14. Local Government Institutions – 73rd & 74th Constitutional Amendments.

Books Recommended :
1. Politics in India : Rajani Kothari
2. Indian Constitution : M.V. Pylee
3. Indian Government and Polities: S. S. Awasti
4. Introduction for Constitution of India : D.D. Basu
5. Indian Government and Politics : K.R. Acharya
6. Indian Politics: Contemporary Issues and Concerns, Singh & Saxena
7. Introduction to the Constitution of India, 5th ed., Sharma

POLITICAL THOUGHT

1. **Ancient 'Indian Political Thought**

   a) Sources of Ancient Indian Political Thought.

   h) Manu: Varnadharma and Dandaneeti.

   c) Koutilya: State and Society.

   d) Goutama Buddha: Dhamma and Sangha.

2. **Modern Indian Political Thought**

   a) Gandhi: Ahimsa and Satyagraha.

   b) Nehru : Democratic Socialism.

   c) Ambedkar : Annihilation of Caste.

   d) M.N. Roy : Radical Humanism.

3. **Western Political Thought**

   Plato, Aristotle, St. Thomas Aquinas, Machiavelli, Thomas Hobbes, John Locke, J.J. Rousseau, Jermy Benthom, J.S. Mill, Hegel, Marx and Gramsci.

Books Recommended :

1. Political Ideas in Ancient India : R.S. Sharma.

2. Western Political Thought: Amal Kumar Mukopadhyay.

3. A History of Political Thought : Sabine G.H.

4. Annihilation of Caste : Ambedkar B.R.

5. Modern Political Theory : Ebenstein W.

6. A History of Political Thought: Plato to Marx, Mukherjee & Ramaswamy.

7. Political Ideologies: Their Origins and Impact.

PAPER - IV (A) (Optional)
INTERNATIONAL RELATIONS

1) International Relations : Evolution, Nature, Scope and Significance.

2) History of International Relations : Rise of Sovereign Nation-State System. First World War, Second World War – Impact on International Relations.

3) Concepts of International Relations : Power – Elements of National Power, Super Power, Regional Power, Unilateral Hegemony – Uni-Polarity, Bipolarity, Multipolarity & Security.

4) International Political Economy :

   i) Historical Overview : Colonialism, Decolonisation, Developing Nations and Problems

   ii) International Financial Institutions: World Bank, WTO, Functions and Role.

   iii) Globalisation and its Impact on Developing Nations.

5) International Organisations : United Nations, Structure and Role, Need for revision of the charter, Regional Organisations, European Union, SAARC and ASEAN.

6) International Security : Arms Race, Arms Control and Disarmament, Issues in Nuclear Politics.

7) Foreign Policy : India's Foreign Policy, Determinants and Features, Non-Alignment, Evaluation and Relevance – Recent Trends.

8) Contemporary Issues International Relations : Environment, Human Rights and Terrorism.

Books Recommended :

1. Politics Among Nations : Hans J. Margentheu.
2. The Analysis of International Relations : Karl W. Deutsch.
3. International Relations : Palmer and Perkins.
4. India Foreign Policy, Foreign Service Institute, New Delhi, India.
5. International Relations between the two World Wars : Carr E.H.

PAPER - IV (B) (Optional)
GOVERNMENT AND POLITICS IN ANDHRA PRADESH

1) Evolution of Indian Federal Structure – Integration of Indian States – Constitutional Framework.

2) Historical Background of the A.P. State.

   a. Socio-Political Struggle in Hyderabad State.

   b. Socio-Political Struggle in Madras Presidency.

   c. Formation of Andhra State.

   d. States Reorganisation and Formation of Andhra Pradesh.

3) Political Institutions :

    a. Executive: Governor, Chief Minister and Council of Ministers – Powers and Functions.

    b. Legislature : Powers and Functions.

    c. Judiciary : Powers and Functions.

4) Party System :

    a. National and Regional.

    b. Electoral Process – Voting Behaviour.

    c. Electoral Determinants – Patterns of Political Leadership.

    d. Pressure Groups.

5) Social and Political Movements :

    a. Dalit Movement.

    b. Agrarian Movement.

    c. Naxalite Movement.

    d. Sub-regional Movements – Telangana and Jai Andhra Movements.

6) Local Governance and Politics :

    a. Panchayati Raj Institutions.

    b. Urban Local Bodies.

PAPER - IV (C) (Optional)
PRINCIPLES OF PUBLIC ADMINISTRATION

1. Meaning, Scope and Importance of Public Administration – Relation with Political Science. Sociology and Economics.

2. Public Administration and Private Administration, Differences and Similarities.

3. Chief Executive – Role and Functions.

4. Line and Staff Agencies.

5. Bases of Departmental Organisation.

6. Principles of Organisation – Hierarchy, Span of Control, Coordination, Unity of Command, Delegation of Authority, Centralisation and Decentralisation.

7. Public Policy Formulation – Decision Making.

8. Human Resource Management – Recruitment, Training, Promotion, Morale and Retirement.

9. Financial Administration – Budget – Principles – Budgetary Process – Accounting and Auditing. Comptroller and Auditor General.

10. Administrative Accountability – Legislative – Executive – Judicial and Popular Control.

11. Public Relations – Meaning and Importance.

Books Recommended :

1. Mohit Bhattacharya : Public Administration Theory & Practice.
2. Avasthi and Maheshwari : Public Administration Theory & Practice.
3. Mohit Bhattacharya : New Horizons of Public Administration.
4. Chitra Ramachandran : Indian Public Administration.
5. M.P. Sarma : Public Administration Theory and Practice.
6. R.K. Arora : Indian Administration.
7. Vishnu Bhagavan & Vidyabhushan : Public Administration.
8. Prabhuvapalana Shastram : Telugu Academy Publications.

B.A.
HISTORY NEW CURRICULUM

FIRST YEAR

PAPER - I : History and Culture of India Upto AD 1526

SECOND YEAR

PAPER - II : History and Culture of India 1526-1950

THIRD YEAR

PAPER - III : History of Modern World (1453-1945 AD)

Note : The College offers 4 optional in BA III Year.
The student has to choose one option from the below:

PAPER - IV : OPTIONALS

    (a) History and Culture of Andhra Pradesh (from Satavahanas to 1956 AD)

    (b) Ancient Civilisations

    (c) Cultural Tourism in India

    (d) Principles and Methods of Archealogy

B.A. History New Curriculum

PAPER - I
HISTORY AND CULTURE OF INDIA UP TO AD 1526

UNIT - I :

Influence of Geography on History-Survey of the Sources- Pre-historic period-Paleolithic, Mesolithic and Neolithic cultures- Role of technology. Indus Valley Civilization-its characteristic features-Vedic culture-Early and later Vedic periods-Post-Vedic period-Emergence of Varna and caste system -Rise of new Religious Movements-Jainism and Buddhism in 6th Century B.C Impact on society and culture.

UNIT - II :

A brief survey of political conditions in Ancient India-Magadha. Alexander's Invasion and Mauryas- Ashoka's Dhamma. Its nature and propagation- Mauryan Administration-Economy- Art and Architecture.

UNIT - III :

Post-Mauryan period in North India-A brief political survey of Kushans, Guptas. Pushyabuti and Rajputs: Polity and Administration - Social conditions - Caste System- position of Women- Economy,-Indian Feudalism-Art-Architecture- Education, Literature, Philosophy. Science and Technology.

UNIT - IV :

A brief political survey of South India-Sangam Age- Satavahanas-Pallavas-Cholas- Chalukyas. and Rashtrakutas- Kakatiyas and Vijayanagara-Polity and Administration. Society. Economy-Art and -Architecture.

UNIT - V :

Invasions of Arabs. Ghaznavids and Ghoris and Delhi Sultanate-A brief political Survey, Polity and Administration under Delhi Sultanate,-society, composition of rural Society. Nobility- Status of Women, Economic and Technological developments. Agriculture-Industry-Trade and Commerce-Urbanisation. Art and Architecture-Fine Arts- education and Literature.

UNIT - VI :

Impact of Islam on Indian Society and culture-Bhakti and Sufi Movements Emergence of Composite culture.

PAPER - II
HISTORY AND CULTURE OF INDIA (1526 -1950)

UNIT - I :

Survey of Sources- Establishment of Mughal Empire - Sur Interrugnam - Brief Survey of Political History up to 1707 AD -Polity and Administration -Society-Social Composition-Ulema-Nobility-peasantry - Artisans -Slaves- Status of Women -Economy: Agriculture Industries, Trade and Commerce. Economic and Technogical developments: Religion - Hindu-Muslim Relations-Composite Culture. Education, Literature, Art, Architecture and Fine Arts. Decline and Disintegration of Mughal Empire -Rise of Regional Powers-Marathas - Sikhs

UNIT - II :

Advent of European powers-Portuguese, Dutch, English and French Expansion and consolidation of British Empire-Wars-Diplomacy-Policies pursued-Subsidiary Alliance-Doctrine of Lapse. Economic policies and changes-Mercantilism and Free trade policies-Land Revenue   Settlements- Permanent-Ryotwari-Mahalwari Systems-Intrigation Commercialization of Agriculture-Condition of peasants-Famines -Decline of Cottage industries (de-industrialization)

UNIT - III :

Anti-Colonial Upsurge-Peasant and Tribal Revolts-1857 Revolt-Causes- Results and Nature.

UNIT - IV :

Factors for social change-Christian Missionaries-Western Education- Emergence of New Middle Classes-Growth of press-Socio-Religion Reform Movements-Brahma Samaj-Arya Samaj-Theosophical Society-Ramakrishna Mission-Aligarh Movemeit-Self-Respect movements-Jyotiba Phule-Narayana Guru. Periyar and Dr. B.R. Ambedkar.

UNIT - V :

Indian National Movement -Factors for the growth of Nationalism - Indian National congress-Three Phases of Freedom struggle-revolutionary Movements-Left-Wing movement-Peasant and workers movements.

UNIT - VI :

Emergence of Communal trends-partition of India- Integration of Princely States into Indian Union.

PAPER - III
Paper Code E-H-3
HISTORY OF MODERN WORLD (1453 -1945 AD)

UNIT - I :

Characteristic features of Renaissance-Significance of Reformation and Counter Reformation movements in Europe-Geographical Discoveries and Rise of Colonialism, Mercantilism and Commercial Revolution-Emergence of Modern World Economy.

UNIT - II :

Emergence of Nation States in Europe - Nature of Feudalism in Europe and Asia.

UNIT - III :

Age of Revolutions -Glorious Revolution (1688)-American Revolution (1776)- French Revolution (1789)

UNIT - IV :

Industrial Revolution and Rise of Capitalism -Impact on Asia and Africa-Meizi Restoration and Modernisation of Japan- Unification Movements in Germany and Italy

UNIT - V :

World between 1914-1945 Rivalry among colonial powers Imperialist Hegemony-Causes and consequences of first World War - World between the Wars - League of Nation, Fascism in Italy, Nazism in Germany, Militarism in Japan- Communist Movements in Russia and China.

UNIT - VI :

Causes and consequences of Second World War -UNO.

PAPER - IV (a)
Code : CHA
HISTORY LAND CULTURE OF ANDHRA PRADESH
(From Satavahanas to 1956 A.D)

UNIT - I :

Influence of Geographical features on History: Sources-A Brief Survey of political history from Satavahanas to Vijayanagara period- Socio- Economic-Cultural conditions _ under Satavahana, Kakatiya and Vijayanagara rulers-Growth and Spread of Jainism and Buddhism and their contribution to Art and Architecture.

UNIT - II :

The Qutb Sahis — A Brief Survey of Political History - Society, Economy and Culture. The Asaf Jahis - A Brief Survey of their political history - Society, Economy and Culture - Salarjung's Reforms.

UNIT - III

Andhra Under Colonial Rule: Coming of European Merchant Companies- Conquest of Andhra by the British- Early Uprisings-Administration- Land Revenue Settlements-Agrarian Conditions - Famines - Impact of Industrial Revolution on Andhra Economy-Sir Thomas Munroe- Impact of 1857 Revolt in Andhra.

UNIT - IV

Social Reform and Literary Movements: Veeresalingam, Raghupathi Venkataratnam Naidu, Gurajada Appa Rao, Komarraju Venkata Lakshmana Rao, Non-Brahmin, Adi Andhra, Dalit, Self-Respect Movements- New Literary Movements-Gurram Jashua, Boyi Bhimanna, Viswanatha Satyanarayana, Rayaprolu Subba Rao, Sri Sri.

UNIT - V

Freedom Movement in Andhra : Vandemataram, Home Rule, Non Co-Operation, Alluri Sitarama Raju- Rampa Rebellion 1922-24-Civil Disobedience and Quit India Movements.

Political Consciousness in Telangana : Nizam Andhra Maha Sabha, Hyderabad State Congress, Razakars, Police Action and Accession of Telangana into Indian Union.

UNIT - VI

Leftist Movements in Andhra and Telangana – Peasant Armed struggle – Tribal Uprisings-Komaram Bhimu- Bhoodan Movement.

Movement for Separate Andhra State : Andhra Manila Sabha- Sree Bagh Pact-Martyrdom of Potti Sree Ramulu-Formation of Andhra State, 1953 - Vishalandhra Movement- State's Re-organization Commission-Gentlemen's Agreement-Formation of Andhra Pradesh in 1956.

PAPER - IV (b)
Paper Code - AZN
ANCIENT CIVILISATIONS

UNIT - I

Environmental human interaction, hunting, gathering of food and food production, Tool making impact and role of Technology, human settlements-Division of labour-craft specialization and Geographical Wealth-Role of Technology in the evolution of the World civilization.

UNIT - II

Egyption Civilization-origin and spread -Polity Society-Economy-Art and Architecture

UNIT - III

Mesopotamia Beginning and Expansion-contacts with other Civilization-Nature of Polity-Socio-Economic and religious conditions evolution of script, Art & Architecture

UNIT - IV

China-Nature and Extent of Civilization -State Structure -Social Divisions-Economic condition- Science & Technology Religion-Philosophy and Culture.

UNIT - V

Greek Civilization, Nature of Polity and Society- agrarian economy-Trade and Urbanization Distinctive features of Greek civilization-Philosophy-Education-Art and Architecture

UNIT - VI

Roman civilization: Origin and spread of Roman Empire -Features or Polity and Roman Republic-Slavery-Social Structure-Economic Organization-Religious System and cultural contribution-Decline

<center>**PAPER - IV (c)**
Paper Code - CTRI
CULTURAL TOURISM IN INDIA</center>

UNIT - I :

Tourism -Concept and meaning - Nature-Scope-Tourism as an industry-Socio-Economic impact of Tourism-History of tourism development in India.

UNIT - II :

History and culture as tourism product-Monuments, religious and secular-Historical Sites-Historical and cultural events-Impact of tourism development on protection and conservation of historical monuments and sites and vice-versa.

UNIT - III :

Socio-cultural products: Fairs and festivals of India-performing Arts (dance, drama and music)-Museums, Art-galleries, yoga and health centers-Indian cuisine.

UNIT - IV :

Nature-based products: Eco-tourism-Beaches, Hill-resorts, surf-riding, ballooning, rafting, gliding-wild-life sanctuaries-National Parks, Safaris, Mountainering-Trekking-Skiing-Sports tourism.

UNIT - V :

Tourism Potential of Handi-Crafts: Textiles -Metal work, Stone-ware, Wood carvings, Furniture, Jewellery, toys, musical instruments - Terracotta-Display and sale of handicrafts-Shopping at heritage centers -organising exhibition series -Duty-free shops

UNIT - VI :

Publicity of cultural transits products-Tools of publicity. Role of films, T.V., Press, Poster-display, brochures, Role of Guide in cultural tourism promotion.

PAPER - IV (d)
Paper code - PMA
PRINCIPLES AND METHODS OF ARCHAEOLOGY

UNIT - I :

Nature and History of Archaeology: Definition and scope of Archaeology-Exploration and Survey -Relationship of archaeology with history, anthropology and the pure sciences

UNIT - II :

Excavation: purposes and methods -underwater archaeology with special reference to developments in India -Dating methods: Strategraphy, Radio-carbon method, Methods of relative dating, Typological sequences, Absolute dating, Thermo-luminescence

UNIT - III :

Approves for Documentation and Reconstruction of Past life Ways: and Social and Economic Organisation Settlement Patterning at the micro level: site catchment analysis; site formation Processes-Ethno Archaeology: Methods Inter pretative technique -Technology of pre-historic art.

UNIT - IV :

Conservation and preservation of Archaeological Remains; Principles of conservation of cultural property -Chemical treatment of organic and Inorganic objects -Museums and storage and display of antiquities -conservation of monuments and other art of objects

UNIT - V :

Important excavated sites; Taxila, Hastinapura, Pataliputra, Arikamedu Nagarnjuna, Konda, Amaravathi and Kotilingala.

UNIT - VI :

Archeology and the Public; Threats to Archaeological sites; damage by development projects, damage due to ignorance, negligence, greed for land and wanton destruction -Legislative basis of conservation and protection of heritage -Archeology and Public awareness.

B.A. ECONOMICS

FIRST YEAR

PAPER - I : Micro Economics

SECOND YEAR

PAPER - II **:** Macro Economics

THIRD YEAR

PAPER - III **:** Indian Economic Development

PAPER - IV **:** **OPTIONALS**

    (a) Rural Development

    (b) Economics of Statistics

    (c) Public Finance and International Economies

B.A. (ECONOMICS)
FIRST YEAR

PAPER - I :
MICRO ECONOMICS

Module - 1 : INTRODUCTION

Nature, Definition and scope of Economics - Methodology in Economics - Micro and Macro; Static and Dynamic, Normative and Positive - Inductive and Deductive Analysis - Partial and General Equilibrium - Choice as an economic problem.

Module - 2 : CONSUMER BEHAVIOUR

Utility Analysis - Cardinal and ordinal approaches - Law of Diminishing marginal utility, Law of Equi-marginal utility, Indifference curves - Properties of indifference curves - Price (Budget) line - Equilibrium of the consumer with the help of indifference curves. Demand Analysis - Law of demand - Elasticity of Demand - Price, Income and cross elasticities, Demand forcasting - Meaning and factors influencing demand forecasting - Consumer surplus - Engel curve.

Module - 3 : THEORY OF PRODUCTION AND COSTS

Objectives of a firm - Production function - Concept of Cobb-Douglas production function - Isoquant - Factor substitution - Law of variable proportions, law of Returns to Scale - Expansion path - Different Concepts of Revenue and Costs and their interrelation - Euilibrium of the firm - Break - Even analysis.

Module - 4 : MARKET STRUCTURE

Market forms - Perfect and imperfect markets. Price Determination and Equilibrium of a firm and industry under perfect competition - Monopoly -Price determination under monopoly - Price discrimination - Monopolistic competition - Price determination. Oligopoly (Kinked demand curve).

Module - 5 : FACTOR PRICING

Marginal productivity theory of distribution - Theories of wage determination - Wages and collective bargaining; minimum Wage -

Rent - Scarcity rent, Differential rent - Quasi rent. Interest - Classical, Neo-Classical and Keynesian theories. Profit - Dynamic, Innovations, Risks and Uncertainty theories.

References :

1. R.G, Lipsey and K.A. Chrystal - "ECONOMICS", Oxford University Press, 10/3, 2004.

2. P.A. Samuelson & W.D. Nordhaus - "ECONOMICS", Tata Mc. Graw Hill, 18/e,2005

3. N. Gregory Mankiw - "Principles of Economics", Thompson, 4/e, 2007

4. H.L. Ahuja - "Advanced Economic Theory", S. Chand, 2004

5. M.L. Seth - "Micro Economics", Laxmi Narayan Agarwal, 2007

6. D.M. Mithani & G.K. Murty - "Fundamentals of Business Economics", Himalaya Publishing, 2007.

7. Telugu Academy Publications

8. AUSDE - Study Material

9. Bilas, A. - "Micro Economic Theory", International Student Edition, Mc. Graw Hill, 1971.

SECOND YEAR

PAPER - II :
MACRO ECONOMICS

Module - 1 : NATIONAL INCOME

Meaning, Definition and importance of Macro Economics - National Income: Meaning, Definitions: National Income, GNP & NNP, GDP *&* NDP, Personal Income (PI), Disposable Income (DI), Per Capita Income (PCI), Real National Income (RNI) - Methods of Estimation of National Income (Ml) - Measurement of National Income in India.

Module - 2 : THEORIES OF EMPLOYMENT

Classical theory of employment - Say's law of markets - Keynesian theory of employment - Consumption function - APC, MPC, factors influencing consumption function - Investment function - MEC and Rate of Interest and the concept of Multiplier - Accelerator - Applicability of the Keynesian theory to the developing countries.

Module - 3 : MONEY AND THEORIES OF MONEY

Meaning, functions and classification of Money - Gresham's law - R.B.I. Classification of Money – M_1, M_2. M_3, M_4 Theories of Money - Fisher's quantity theory of Money, Cambridge approach (Marshall, Pigou, Robertson and Keynes).

Module - 4 : TRADE CYCLES AND INFLATION

Trade cycles - Meaning and definition - Phases of a trade cycle - Inflation -Definition - Types of Inflation - Causes and effects of inflation - Measures to control inflation,

Module - 5 : BANKING, STOCK MARKET AND INSURANCE

Functions of Commercial banks - The process of credit creation - Concept of Non Banking Finance Companies (NBFCs) - Concept of SEBI Stock Market - Meaning, functions and importance of Stock Market - Primary and Secondary Markets. Concepts of (a) Shares (b) Debentures. Insurance - Types of Insurance - Life Insurance and General Insurance - Functions of the Reserve bank of India- Methods of credit control -Quantitative and Qualitative Methods.

References :

1. G. Ackley – "Macro Economics Theory and Policy", Collier Macmillan, 1978.

2. E. Shapiro – "Macro Economic Analysis", Galgotia Publications, 1999.

3. Central Statistical Organisations – "National Accolunts Statistics".

4. R. Dornbush, S. Fisher and R. Startz – "Macro Economics", Tata Mc. Graw Hill, 9/e, 2004.

5. M.L. Seth – "Macro Economics", Lakshmi Narayan Agarwal, 2006.

6. K.P.M. Sundaram – "Money, banking & International Trade", Sultan Chand, 2006.

7. Dillard, D – "The Economics of John Maynard Keynes", Crossby Lockwood & Sons.

8. Telugu Academy Publications

9. AUSDE – Study Material.

10. M.N. Mishra & S.B. Mishra – "Insurance Principles & Practice" S. Chand 2007.

11. Bharati V. Pathak "The Indian Financial System Markets, Institutions & Services" Pearson 2008.

THIRD YEAR

PAPER - III
INDIAN ECONOMIC DEVELOPMENT &
A.P. ECONOMY

NOTE:

In this paper organizing a field study, or project work or assignment with Viva-Voce with a weightage of 20 marks is recommended. The theory paper should consist of 80 marks only.

Module - 1 : CONCEPTS OF DEVELOPMENT

Meaning of Economic growth and development - Measures of. Economic Development - GNP, PCI, PQLI and HDI. Factors influencing Economic development -Sustainable development - Balanced and unbalanced growth - Choice of Techniques Labour intensive and capital intensive methods.

Module - 2 : STRUCTURE OF THE INDIAN ECONOMY

Demographic features - Size and growth of the population - Age and sex composition -Rural and Urban population - Occupational distribution - Population policy. National income in India - Trends and Composition - Poverty, Inequalities and unemployment -Causes and consequences. Current Five Year Plan - Objectives, Mobilization and Allocation of Resources - New Economic Reforms - Liberalization, Privatization and Globalization in India - Inclusive Growth.

Module - 3 : INDIAN AGRICULTURE

Nature and importance; Trends in agricultural Production and Productivity; factors determining productivity. Rural Credit - Micro Finance and Self Help Groups (SHGs). Agricultural price policy, Crop insurance, Agricultural Infrastructure and food security.

Module - 4 : INDIAN INDUSTRY AND SERVICES

Structure and Growth of Indian Industry - Industrial policies of 1956 and 1991. Growth and problems of Small Scale Industry. Foreign Exchange Management Act (FEMA); Disinvestment policy in India - Foreign Direct Investment - Growing importance of Services Sector in India - Banking, Insurance, Information Technology, Education and Health.

Module - 5 : ANDHRA PRADESH STATE ECONOMY

GSDP - Sectoral Contribution and Trends; Human Resources - Population Trends, Agricultural Sector - Land use and Cropping pattern; Industrial Sector - Small Scale industries, Investment and employment in industrial sector, SEZs; Service Sector - Growth of income and employment in the service sector, Information Technology (IT).

References :

1. Dhingra, I.C. - "Indian Economy", Sultan Chand, 2007.

2. Ruddar Dutt and K.P.M. Sundaram - "Indian Economy", S. Chand & Co., 2008.

3. G.M. Meier - "Leading Issues in Economic Development", Oxford University Press, New York, 3/e.

4. M.P. Todaro - "Economic Development", Longman, London, 6/e, 1996.

5. Reserve Bank of India - Handbook of Statistics on Indian Economy (Latest).

6. S.K. Misra & V.K. Puri - "Indian Economy", Himalayan Publishing House, 2006.

7. R.S. Rao, V. Hanumantha Rao & N. Venu Gopal (Ed.) - Fifty Years of Andhra Pradesh (1956-2006), Centre for Documentation, Research and Communications, Hyderabad, 2007.

8. Telugu Academy Publications.

9. United Nations, "World Development Report", Oxford, 1990-2008, Different editions.

10. AUSDE - Study Material.

PUBLIC FINANCE AND INTERNATIONL ECONOMICS

Module-1 : Public Finance and Taxation

In this paper organizing a field study, or project work or assignment or Viva-Voce with a weightage of 20 marks is recommended. The theory paper should consist of 80 marks only.

Module - 1 : Concepts of Development

Meaning and scope of public finance, Distinction between private and public finance; Public goods vs private goods; Role of the state in mixed economy; Source of public revenue, taxation, meaning direct and indirect taxes and their merits and demerits; Canons of taxation; impact, shifting and incidence of taxation; Effects of taxation; Characteristics of good tax system.

Module - 2 : Public Expenditure and Public Debt

Meaning and classification of public expenditure; Canons nd effects of public expendititure; Public debt-Sources of public debt; Effects of public debt; Methods of debt-redemption; Growth of India's public debt; Concepts of budget deficit.

Module - 3 : Theories of International Trade

Inter-regional and International trade; Absolute advantage; Comparative advantage and Hecksher-Ohlin. Trade as an engine of economic growth. Terms of trade.

Module - 4 : Tariffs nd Balance of Payments

Tariffs and quotas, Concept of optimum tariff. Balance of Trade and Balance of Payments, Dis-equilibrium in Balance of Payments. Causes and corrective measures.

Module - 5 : Foreign Trade in India

Composition and Direction of Foreign Trade, Causes and effects of peristent deficit in Balance of Payments. Need for and rationale of trade reforms. Export Promotion Policy, Exim Policy, Exim Bank, Foreign Direct Investment in India, IMF, IBRD, WTO and Liberalisation, Privatisation, Globalisation Programmes in developing countries.

Basic reading list :

1. Bhatia, H.D.: Public Finance, Vikas Publishing House Pvt. Ltd., New Delhi.

2. Thyagi, B.P.: Public Finance.

3. Sodersten, B.O. : International Economics, MacMillan Press Ltd., London.

4. Mannur, H.G. : International Economics, Vikas Publishing House Pvt. Ltd., New Delhi.

5. Kindlberger, C.P. : International Economics, R.D. Irvin, Homewood.

6. Salvatore, D.L.: International Economics, Prentice Hall, Upper Saddle River.

7. Bhagawathi, J. (Ed.) : International Trade, Selected Readings, Cambridge University Press, Mass.

8. Bhargava, P.K. : Sum Aspects of Indian Public Finance, Uppal Publishing House, New Delhi.

9. Musgrave, R.A. : The Theory of Public Finance, McGraw Hill, Kogakshusa, Tokyo.

PAPER - IV (B)
OPTIONAL PAPER

RURAL DEVELOPMENT

Module-1 : Scope of Rural Development

The concept of Rural Development alternative prospectives on Rural Development.

Module-2 : Rural Demography

Demography problems of rural areas - Approaches to population control - Family Welfare Programmes - Problems of Health, Nutrition & Medical care.

Module-3 : Rural Unemployment

Pattern of land holdings and inequalities in land distribution - Rural unemployment, concepts and measurement - Employment and Minimum Wage Legislation.

Module-4 : Rural Credit and Indebtedness

Rural indebtedness - nature and magnitude of the problems - Source of rural credit - Multigency approach - Cooperation - Nationalised Banks - Rural Banks.

Module-5 : Rural Industrialisation

Importance of rural industrialisation - Cottage and Small Scale Industries - Agro based industries - Problems and Prospects.

Module-6 : Rural Development Programme

Asset based and employment rural development programmes - Agriculture IBRD - NREP - Anti-Poverty programmes for weeker sections - Rural Education and Adult literacy and its importance.

Module-7 : Institutions for Rural Development

Democratic decentralisation - Panchayath Rj, Co-operatives, DRDA, ITDA, SC & BC Corporations - DIC - District Planning Boards.

Module-8 : Rural Migration

Surplus labour in rural areas - Rural migration its impact on rural development.

Module-9 : Rural Labour and Problems

Problems and intensity of unemployment of rural labour in different sectors with reference to artisans and other self employed opportunities - alternative models of rural development - Gandhian.

Reference Books :
1. K.P. Dutta & Sundaram : Indian Economy
2. Liption, M. Urban Basis : "Why Poor People Stay Poor"
3. Satya Sundaram : "Anti-Poverty Rural Development"
4. R.C. Saxena : "Labour Problems & Social Welfare"
5. Kuchel : "Industrial Economy of India"
6. Sabtaj Azeez : "Rural Development"
7. Desai, V. : "Rural Development (Three Volumes)
8. Telugu Academy Text Books.

ECONOMICS OF STATISTICS

Module-1 : Definition of Statistics Scope of statistics in Economics.

Module-2 : Primary and Secondary methods of collection of statistical data.

Module-3 : Data Analysis - Classification and Tabulation of statistical data-frequency tables.

Module-4 : Diagramatic representation - Bar Diagrams - Pie Diagrams - Histogram, Frequency Polygon, Frequency curves and Ogive

Module-5 : Measures of Central Tendency - Arithmetic mean Median, Mode, Geomatric Mean, Harmonic Mean Merits and Demerits.

Module-6 : Measures of Dispersion - Range, Quartile deviation, Mean deviation and standard deviation - Merits and Demerits - Co-efficient of variation - Skewness and Kurtosis, simple correlation and Regression.

Module-7 : Index Numbers - Construction of Index Numbers - Laspayer's, Pasches's and Fisher's ideal index numbe-cost of living index number.

Module-8 : Time Series - Time series - Components - methods of calculation of trend

Module-9 : Indian Official statistics & Organisation Structure.

   a) National Income Statistics
   b) Population Statistics (1961 onwards)
   c) CSO & NSS

Books for Study and Reference :
1. Data base of Indian Economy-published by Statistical publishing society vol. I, II and III
2. D.N. Elhance - "Statistics"
3. B.N. Astana : Elements of Statistics
4. C.B. Gupta : An introduction to statistical methods
5. Telugu Akademy's publication on Economic statistics
6. S.P. Gupta : Statistical Methods

B.A.
SOCIOLOGY

FIRST YEAR

PAPER - I   :   Basic Concepts and Perspectives

SECOND YEAR

PAPER - II   **:**   Society in India

THIRD YEAR

PAPER - III   :   Modern India - Social Change : Development and Issues

PAPER - IV   :   **OPTIONALS**

      (a)   Applications of Sociology

      (b)   Rural and Urban Sociology

      (c)   Social Demography

      (d)   Social Movements

B.A. SOCIOLOGY

FIRST YEAR

PAPER -1 :
BASIC CONCEPTS AND PERSPECTIVES

OBJECTIVES:

This Introductory Paper is intended to acquaint the students with sociology as a social science and the distinctiveness of its approaches among the social sciences. It is to be organized in such a way that even students without any previous exposure to sociology could acquire an interest in the subject and follow it.

1. Introduction to Sociology :

Definition of Sociology - Nature and Scope of Sociology -Origins and development of Sociology - Founding fathers and their contributions: Auguste Comte, Herbert Spencer, Karl Marx, Emile Durkheim and Max Weber -Sociology and other social sciences - Sociology in India -Importance of Sociology.

2. Human Society and Culture

Human society, Definition, characteristics and functions - Individual and society- Culture and Personality- Heredity and Environment.

3. Structure of Human Society

Social groups and its major types - Community - Association - Institution - Status and Role - Norms, Values and Customs - Power and Authority-Concepts of State, Nation and Society and their differences.

4. Basic Social Institutions

Marriage, Family and Kinship, Religion, Economy, Education, Polity and Law

5. Socialization and Social Control

Concept of Socialization - Theories of development of 'Self of G.H. Mead, C.H. Cooley and Sigmund Freud - Agencies of Socialization: Family, School, Religion, Peer group, Community and Government- Social Control: Concepts of Anomie, Deviance and Social Control - Means of Social Control: Formal and Informal means.

6. Social Stratification

Social Differentiation- Social Stratification: Theories of social stratification; Functional and Conflict theories - Dimensions of Social Stratification; Class, Caste, Power and Gender.

7. Social Interaction and Processes

Social Interaction - Social Processes: Cooperation, Competition, Conflict, Accommodation and Assimilation - Social Disorganization

8. Sociological Perspectives

a. Functional perspective
b. Conflict perspective
c. Symbolic Interactionist Perspective

References:

1. C.N. Shankar Rao : Sociology, Principles of Sociology with an introduction to Social thought, S. Chand & Co. Ltd., New Delhi.
2. T.B. Bottomore : Sociology A Guide to Problems and Literature Blackie & Son (India) Ltd., / S. Chand & and Co. Ltd., New Delhi.
3. Alex Thio : Sociology
4. Inkeles, Alex : What is Sociology? Prentice Hall of India, New Delhi
5. Peter Worsley (Ed) : Introducing Sociology Penguin Books.
6. M. Haralmbos with R.M. Heald : Sociology Themes & Perspectives Oxford University Press, Delhi.
7. N. Jayaram : Introductory Sociology Macmilan India Limited.

PEDAGOGY:

While introducing sociology as a social science emphasis should be laid on the distinctiveness of its perspective rather than on its substantive themes of study.

For effective teaching and meaningful learning, illustrations may be drawn from relevant empirical studies.

Throughout the course, conscious effort should be made to drive home the relevance and significance of sociology for understanding society and in attempting to solve its problems.

SECOND YEAR

PAPER - II
SOCIETY IN INDIA

OBJECTIVES:

It is presumed that the student has some familiarity with Indian Society by virtue of the fact that he is a member of it and that he has observed and experienced some facets of it. However, this familiarity is likely to be superficial, selective and rather fragmentary. The course is aimed at rectifying these limitations by presenting a comprehensive, integrated and empirically-based profile of Indian Society.

The continuity between the present and the past is an evident feature of Indian society. Though this continuity is reflected in the structure of the course, the focus is on the contemporary Indian society. It is hoped that the sociological perspective on Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

1. **Structure of Indian Society**

   Diversity and Unity; Religious, Linguistic, Cultural and Regional diversities of Indian society - Basic tenets of Islam. Christianity, Sikhism, Buddhism, Jainism, and Zoroastrianism- Hindu Social Organization: Purusharthas, Varnashrama dharma.

2. **Social Institutions**

   Forms of Marriage, Family and Kinship among Hindus, Muslims and Christians and their changing trends. Decline of Joint family: causes and consequences

3. **Economy**

   Land ownership and land distribution- Agrarian structure and relations and decline of Jajmani system - Present occupational structure- Features of Tribal economy; Urban Economy; Industrial, Service and Informal Sectors.

4. **Stratification**

   Varna and Jati - Definition, features and functions of Caste system; Caste and Class; Class in India: Agrarian and Non Agrarian classes, Emergence of middle class- Dominant Caste; changing trends in caste system.

5. **Polity**

   System of governance - Nation, State and Local Governance: Access to politics: Caste, Religion, Language and Region - Differential access to political power.

6. **Education:**

   Traditional Educational System - Emergence of modern formal education system in India- Differential access to education in India- Education and Social Mobility.

7. **Communities**

   Tribal Community, Rural community and Urban Community: Distribution of population - Difference between rural and urban communities- Village settlement patterns - Growth of urban centres, types of urban communities.

8. **Problems of Indian Society**

   a. Tribal Society: Exploitation of Tribes. Eand alienation and displacement and Problems of Health and Nutrition

   b. Rural Society: Poverty and Unemployment, Indebtedness and farmers' suicides and Illiteracy

   c. Urban Society: Housing and civic services, Pollution, Crime and Juvenile Delinquency and HIV/AIDS.

References:
1. Ram Ahuja : Indian Social System Rawat Publications, New Delhi.
2. Ram Ahuja : Social Problems in India. Rawat Publications, New Delhi.
3. M.N. Srinivasa : Indian Social Structure Hindustan Public Corporation (India), Delhi.
4. Patricia Uberoi (Ed) : Family, Kinship And Marriages in India, Oxford University Press, New Delhi.
5. S.C. Dubey : Indian Society National Book Trust, India, New Delhi.
6. David Mandlebaum : Society in India, Popular Prakasan, Bombay.
7. Victors S D' Souza : Inequality and its Perpetuation Manohar Publications, New Delhi.

PEDAGOGY :

The use of audio-visual media should be a necessary and important component of instruction. The participation and involvement of students should be ensured through formal and informal discussions in the class room and field visits. They should be encouraged to write short essays on the local situation and local issues under the guidance of the teacher.

Wherever possible, illustrations should be drawn from the local situation.

THIRD YEAR

PAPER - III

MODERN INDIA: SOCIAL CHANGE; DEVELOPMENT AND ISSUES

OBJECTIVES:

Society in India today is undergoing rapid and massive changes. Many of changes are such that they tend to call into question the ages-old social norms and practices, thus giving rise to some critical social issues and problems.

This course is designed to identify and analyze some of such emerging social issues and problems from sociological perspective. In the interest of systematic ordering, the issues and problems have been classified into two broad sets: structural, and developmental.

The course seeks to go beyond the commonsense understanding of the prevailing social issues and problems in order to project them into their structural context. Accordingly, if focuses on their structural linkages and interrelationships.

Hence the objectives of the course are to sensitize the students to the emerging social issues and problems of contemporary India, enable them to acquire sociological understanding of these issues and problems over and above their commonsense understanding, empower them to deal with these issues and problems and to serve as change agents both in governmental and non-governmental organizations.

1. **Social Change**

    Meaning, definition and nature of social change-Factors affecting social change-Overview of theories of social change: evolutionary, structural and modernization

2. **Development and Underdevelopment**

    Concepts of Development and Underdevelopment- Indicators of development and Human Development Indices - Concepts of Economic Development, Social Development and Sustainable Development - Globalization and consequences

3. **British Rule and Social Change**

Changes in administrative, Judiciary, agrarian (land revenue/ownership), educational institutional structure and their social impact (modernization)

4. **Social Movements**

   a. Social reform movements: Abolition of Sathi and child marriage; Widow remarriages- Arya Samaj, Bramho Samaj.

   b. Protest & Self respect movements: Non-Brahmin Movement, Backward Class and Dalit movements

   c. Agrarian Movements and Peasant movements

5. **Independent India and Trends of Social Change**

Salient feature of constitution of India - Community development and Democratic decentralization- Land reforms- Constitutional Safeguards for weaker sections (SC, ST, BC, Women, Differentially abled and children)

6. **Planned development**

Meaning of planned development- Overview of objectives and achievement of Five Year Plans -Green revolution

7. **Intervention Programmes**

Poverty reduction programmes - Education, Health and Skills promotion- Social Exclusion & Inclusive Policies

8. **Social Issues and Challenges**

Population explosion -Migration & urbanization -Gender Issues: Domestic Violence, Trafficking; Empowerment -Development induced displacement -Problem of the elderly; Violation of Human Rights.

References :

1. A.R. Desai : Social Background of Indian Nationalism. Popular Prakasan, Bombay.

2. Yoginder Singh : Modernization of Indian Tradition, Rawat Publication, New Delhi.

3. Victor S D' Souza : Development Planning and Structural Inequalities, Sage Publication, New Delhi.

4. Satish K Sharan (Ed) : Reform. Protest and Social Transformation, Ashish Publishing House, New Delhi.

5. Sumit Sarkar : Modern India 1885-1947, Mac Millan India Limited.

6. Lloyd I Rudolph S.H. Rudoloph : The modernity of Tradition Orient Longman, New Delhi.

7. Yoginder Singh : Essays on Modernisation in India, Manohar Publications. New Delhi.

8. Yoginder Singh : Social Change in India: Crisis and Resilience, Har-Anand Publication, New Delhi.

9. S K Misra and V K Puri : Economics of Development and Planning, Himalaya Publishing House, Delhi.

10. MSA Rao : Social Movements and Social Transformation, Mac Milan Co Ltd., Delhi.

11. Andre Beteilhe : The Backward Classes and the New Social Order, OUP, Delhi.

12. A R Desai (Ed) : Peasants Struggles in India, OUP, Delhi.

13. Neil J Saelser : Sociology: An Introduction, Wiley Publication, New Delhi.

PEDAGOGY:

The course requires a pedagogy that seeks to project the issues of contemporary India in a social structural perspective. For this purpose, the students have to be sensitized to the structural roots of the problems as well as to the effects of these problems on the existing social structure. In order to give the students a sympathetic understanding of the problem, it will be rewarding to use the methodology of role playing. The students may also be encouraged to make on the spot observations of the problems wherever and whenever they find recurrence of these problems.

The use of audio-visual media should be a necessary and important component of instruction.

The participation and involvement of students should be ensured through formal and informal discussions in the class room and field visits. They should be encouraged to write short essays on the local situation and local issues under the guidance of the teacher.

Wherever possible, illustrations should be drawn from the local situation.

PAPER IV-A (OPTIONAL)
APPLICATIONS OF SOCIOLOGY

Objectives:

To understand the community and to make situational analysis. To enable the students to equip themselves for a career in Social Welfare agencies.

PART -A : (30 Marks) Written examination

1.   Applications of Sociology

Introduction to applied sociology - sociology and social problems - sociology and social change - sociology and social policy and action - sociology and development - sociology and professions.

2.   Participatory Development

Promoting Participatory Development: Need for Social Participation, Community Development and the Community Organization - Principles and Steps - Group Formation and Social Action - Capacity Building Strategies.

3.   Participatory Development Techniques.

Participatory development - Meaning, Techniques of Participatory Development, PRA techniques.

4.   Counseling

Meaning; need; Types of counseling, Methods of counseling.

5.   Field Survey & Report Writing

Need, Meaning of survey, types of survey Steps in conducting survey; Data collection methods ;Salient features of report writing

PART - B (30 Marks) - Internal Valuation

PROJECT REPORT

1.   Preparation of a Questionnaire and Interview Schedule on given topic.

2.   Data collection.   50 hrs

3.   Data Analysis and Report Writing

4.   Class room exercises

    a.   Counseling through role-playing - each student has to do TWO cases.

b. PRA in the college or neighborhood or community - each student has to employ at least TWO PRA techniques (Transact walk, Social Mapping, Resource Mapping, Social Ranking etc.)

The Project Report must consist of at least 25 pages.

References:

1. Somesh Kumar : Methods for Community Participation, Vistar Publication, New Delhi.

2. Ranjit Kumar : Research Mythology, Pearson Education, Delhi

3. D. Paul Choudary : Introduction to Social Work Atma Ram and Sons, Delhi.

4. Sir Claus Moser & G. Kalton : Survey Methods in Social Investigation Heinemann Educational Books, London

PEDAGOGY

The purpose of the course is to train the students as good investigators. For this reason understanding of social reality especially the local context is imperative. Therefore examples and illustrations may be drawn from local contexts for effective teaching and training.

The main effort may be devoted to making students do exercises in the class and if possible in the field this will make the course interesting and give students the necessary practice and exposure to apply the skills in the field situations as well as data analysis. Students must be encouraged to Study Census reports and writing a brief on the report studied; to conduct a survey on a small community/group and to hold   Group Discussions and role plays with the beneficiaries.

MODEL QUESTION PAPER SHALL BE SENT IN DUE COURSE.

B A. Final Year i.e. III year student can opt any one optional with a minimum strength of 5 students.

PAPER IV-B (OPTIONAL)
RURAL AND URBAN SOCIOLOGY

Part-A :
RURAL SOCIOLOGY

1. Scope and subject matter of Rural Sociology- Rural Sociology in India.

2. Rural Community and its characteristics - Types of Villages and Settlement Patterns in India- Joint and Ryotwari Villages.

3. Caste, Religion and Politics in rural areas- Caste and Village Panchayats, Jajmani system and Land Ownership, Recent Land reforms in Andhrapradesh.

4. Rural Population in India- Rural Health and sanitation - Rural Unemployment-Rural Development in India.

Part-B
URBAN SOCIOLOGY

1. Scope and subject matter of Urban Sociology.

2. Urban Community and its characteristics - Types of Cities- Rural Urban interactions and contrast, Composition of Urban population in India.

3. Levels and Trends of Urbanigation in India, Urbanism as a way of life, Characteristics of pre-industrial and industrial cities.

4. Urban Ecology - Settlement patterns in cities- Urban Social problems: Slums, Rural- Urban migration, Pollution and poverty in Indian cities.

Books recommended:
1. Gramina Nagara Samaja Sastram: Telugu Academy
2. A. R. Desai: Rural Sociology in India
3. Gist and Fava: Urban Society
4. M.S. Rao: Urban Sociology in India

PAPER IV-C (OPTIONAL)
SOCIAL DEMOGRAPHY

1. Definition and Scope of Social Demography- its relation to Sociology and other Social Sciences.

2. Sources of Demographic data- Census, Vital registration and sample surveys.

3. Growth, Composition and Distribution of population in India.

4. Malthus and his contribution of population - Demographic transition theory.

5. Sociological and cultural aspects of fertility, mortality and migration.

6. Population policy and family planning programmes in India. Need for population education programmes - social and cultural barriears in the implementation of the family planning programmes.

Books recommended:

1. Barclay: Techniques of population analysis- joh Willey and sons, NewYork.

2. Agarwala, S.N. : Indian population problems, Mcgraw Hill, New Delhi.

3. K. Davis : Human society.

4. Donald. J. Bogue: social Demography.

5. Asha Beende and Kanithkar, principles of population studies, Himalaya publications house Bombay.

PAPER IV- D (OPTIONAL)
SOCIAL MOVEMENTS

1. Nature and Origin of Social Movements.

2. Historical perspective of the social movements - types of movements in India.

3. Religious movements : Arya Samaj, Brahma Samaj, R.S.S.

4. Agrarian movements: Telangana peasant Armed struggle, Sarvodaya, Bhoodan and Land reforms.

5. Tribal movements: Girijan movements, causes and consequences, / Naxalite movement, Srikakulam movement, Manyam revolt.

6. Sectarian movements: Non Brahmin movement, Siva sena .

7. Regional movements; Separate Andhra movement and Telangana movement, Assam movement, Khalistan movement.

8. Language movement: Problems of National Language, Non- Hindi movements.

9. Trade Union Movements: Origin and Development, INTUC, AITUC, CITU, and HMS.

10. Women's movements: Origin, Consequences etc.

Books Recommended:

1. M.S.A. Rao: Social movements in India.

2. A. R. Desai: Peasant struggles in India.

B.A.
JOURNALISM AND
MASS COMMUNICATION

FIRST YEAR

PAPER - I : Introduction to Journalism and
Mass Communication

SECOND YEAR

PAPER - II **:** Constitution of India and Press
Socio-Economic and Cultural, Affairs

FINAL YEAR

PAPER - III **:** Reporting, Editing Feature Writing

PAPER - IV **:** Public Relations and Multimedia

JOURNALISM AND MASS COMMUNIUCATION
FIRST YEAR

PAPER-I
INTRODUCTION TO JOURNALISM AND MASS COMMUNICATION

1. Definition, nature and scope of Journalism and Mass Communication.

2. History of Journalism - a brief survey of the evolution of modern journalism.

3. History of Indian Press-pre-independence and post-independence periods.

4. Types of mass media - Press, Radio, TV, Films, Advertising and Web-publishing.

5. Functions of mass communication Theories of communications.

6. Types of Communication - Four theories of press.

7. Basic concepts of Journalism.

8. Management of the press - Journalism and big business - recent trends.

9. Journalism and Mass Communication in relation to state and society.
   Note: The curriculum includes periodical assignments and a term paper.

Reference Books:
1. B.N. Ahuja : Theory and Practice of Journalism.
2. John A. Binter : Mass Communication: An Introduction.
3. D.Mc Quail : Mass Communication Theory.
4. R. Parthasarathi : Journalism in India.
5. Keval J. Kumar : Mass Communication in India.

SECOND YEAR

PAPER - II
CONSTITUTION OF INDIA AND PRESS-SOCIO-ECONOMIC AND CULTURAL AFFAIRS

CONSTITUTION:

1. Basic Features of Indian Constitution.

2. Fundamental Rights and Drirective Principles of State Policy -

3. Freedom of Speech and expression.

4. President - Council of Ministers - Prime Minister - Parliament and Judiciary in India.

5. Centre - State Relations - recent trends.

6. Amending process of the Constitution.

PRESS :

1. Laws relating to Press - Rights of the Press.

2. Laws relating to working journalists. Wage Board Tribunals.

SOCIO - ECONOMIC AND CULTURAL AFFAIRS :

Indian Economy - Planning and Economic Development in India - Economic Policies and present economic scene in India and Andhra - Pradesh. Survey of Indian Culture and Heritage.

Note: The curriculum includes one week field work - based training.

Reference Books:

1. D.D. Basu : Constitution of India.
2. B.N. Ahuja : History of Press and Press Laws.
3. D.D. Basu : Laws of the Press in India.
4. B. Radha Krishna Murthy : Indian Press Laws.
5. Romlla Thapar & P. Spear : History of India. And others.

FINAL YEAR

PAPER - III
REPORTING, EDITING AND FEATURE WRITING

REPORTING:

1. Role, duties and qualities of a Reporter.

2. Concepts and definition of news - with reference to developing countries.

3. News process - skills and techniques of reporting,

4. Collectiong news - problems of news gathering.

5. Reporting public affairs - meetings - cultural, social, sports and other events.

6. Specialized reporting - Reporting for T.V. Radio etc.

EDITING:

1. Editing-Types of editorials - editorial comments - column writing.

2. Editorial policy - editorial conferences - Letters to the editor.

FEATURE WRITING:

1. Kinds of writing in magazines - features and articles

2. Scope of feature writing - finding ideas for feature writing - areas of human interest.

3. Types of reviews and magazine articles.

Reference Books:

1. John Honenberg : The Professional Journalist.

2. B.N. Ahuja : A concise course in Reporting.

3. M.V. Kamath : Professional Journalism.

4. Chiltion R. Bush : Editorial Thinking and Writing.

5. K.M. Srivastava : News Reporting and Editing.

6. Brenden Hennesey : Writing feature articles.

7. Nelson : Articles and Feature writing.

PAPER - IV
PUBLIC RELATIONS AND MULTIMEDIA

1.   History and development of public relations in India.

2.   Definition and scope of public relations.

3.   Public Relations - public opinion and propaganda.

4.   Organization and functions of public relations characteristics-of PR man various publice - internal and external.

5.   PR planning - press relations - industrial, consumern, company, community and government relation.

6.   PR and the management.

7.   Tools of public relations - press releses, newsletters, house journals, advertising etc.

8.   Multi-media publicity - concept of multi-media.

9.   Dimensions and practice of mult - media - methods and techniques of multi-media.

10.   Print and electronic media - advertising.

11.   Group communication techniques.

12.   Information caravan concept.

13.   Use of various publicity campaigns in India and developing countries.

Reference Books:

1.   Anil Basu : Problems and Prospects of Public Relations.

2.   J.M. Kaul : Public Relation in India.

3.   D.S. Mehta : Handbook of Public Relations in India.

4.   J.R. Adams : Media Planning.

5.   Hobson : Selection of Advertising Media.

6.   Heiffer & Cocharn : Manual of Audio - Visual Techniques.

B.A. I Year

Compulsary Papers / Common to B.A./B.Sc. / B.Com. and every one has to pass. But Marks will be not be added in Total Marks

CONTEMPORARY INDIA : ECONOMY, POLITY AND SOCIETY

CHAPTER - I :   **Total : 60 Hours**

Basic feature of Indian Economy - Trends in National Income - Agriculture Importance - Problems- Remedial Measures; Industry: Large Scale - Small Scale; Problems and Remedial measures; A brief Review of the Industrial Policies in India. Role of Public Sector in the Context of Globalization, Growing importance of Service Sector.

(No. of Periods Per Week: 8 Hours)

CHAPTER - II

Population, poverty, unemployment and Income inequalities - Causes and consequences - Remedies - Inflation causes and Remedies, Economic Reforms and their impact on Indian Economy - Indian Tax structure.

(No. of Periods Per Week: 8 Hours)

CHAPTER - III

Indian National movement various stages - Its legacy. Integration of Native states and Formation of modern India.

(No. of Periods Per Week: 8 Hours)

CHAPTER - IV

Basic charcteristics of Indian constitution Indian Political party system, Emergence of All India Parties - Regional Parties - collation politics.

(No. of Periods Per Week: 10 Hours)

CHAPTER - V

Center - State Relations - Changes and various commissions - Importance of Human Rights - Violation of Human Rights - Indian

Foreign policy - non - Aligned movement - Local self Governments 73, 74 consistitutional amendments Acts. Right to information Act.

(No. of Periods Per Week: 10 Hours)

CHAPTER - VI

Salient features of Indian Social system, Social groups: Primary and Secondary, Association - Institution. Status and Role - Norms, Values and customs, Concept of Socialization - Agencies of Socialization:

CHAPTER - VII

Gender Issues: Domestic violence, Women Empowerment Entrepreneurship

Programmes : a brief mention of Different on going Welfare Schemes of the central and State Government for Women, Children aged and Youth. Child Labour: causes - prevention.

(No. of Periods Per Week: 6 Hours)

ENVIRONMENTAL STUDIES

B.A. II Year

Six months compulsory core module course
For Second Year Under Graduate Courses of All Branches

UNIT - I : The Multidisciplinary nature of environmental studies

Definition, scope and importance - Need for public awareness.

UNIT – II : Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems :

a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams, and their effects on forests and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources – case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and descertification.

* Role of an individual in conservation of natural resources.

* Equitable use of resources for sustainable lifestyle.

UNIT – III : Ecosystems :

* Concept of an ecosystem.

* Structure and function of an ecosystem.

* Producers, consumers and decomposers.

* Energy flow in the ecosystem.
* Ecological succession.
* Food chains, food webs and ecological pyramids.
* Introduction, types characteristic features, structure and function of the following ecosystem:
    a. Forest ecosystem
    b. Grassland ecosystem
    c. Desert ecosystem
    d. Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV : Biodiversity and its conservations

* Introduction – Definition: genetic, species and ecosystem diversity.
* Biogeographical classification of India.
* Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
* Biodiversity at global, National and local levels.
* India as a mega-diversity nation.
* Hot-spots of biodiversity.
* Threats to biodiversity: Habitat loss, poaching of wildlife, man wildlife conflicts.
* Endangered and endemic species of India.
* Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - V : Environmental Pollution:

* Definition
    a. Air pollution
    b. Water pollution
    c. Soil pollution
    d. Marine pollution
    e. Noise pollution
    f. Thermal pollution
    g. Nuclear pollution

* Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

* Role of an individual in prevention of pollution.

* Pollution case studies.

* Disaster management: Floods, earthquake, cyclone and landslides.

UNIT - VI : Social Issues and the Environment

* From Unsustainable to Sustainable development.

* Urban problems related to energy.

* Water conservation, rain water harvesting, watershed management.

* Resettlement and rehabilitation of people; its problems and concerns – case studies.

* Environmental ethics: Issues and possible solutions.

* Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust – case studies.

* Wasteland reclamation.

* Consumerism and waste products.

* Environment Protection Act.

* Air (Prevention and Control of Pollution) Act.

* Water (Prevention and Control of Pollution) Act.

* Wildlife Protection Act.

* Forest Conservation Act.

* Issues involved in enforcement of environmental legislation.

* Public awareness.

UNIT - VII : Human Population and the Environment:

* Population growth, variation among nations.

* Population explosion – Family Welfare Programme.

* Environment and human health.

* Human Rights.

* Value Education.

* HIV / AIDS

* Women and Child Welfare

* Role Information Technology in Environment and human health.

* Caste studies.

UNIT - VIII : Field Work :

* Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.

* Visit to a local polluted site – Urban/Rural/Industrial/Agricultural.

* Study of common plants, insects, birds.

* Study of simple ecosystems-pond, river, hill slopes, etc.

References :

1. Brunner R.C. : 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.

2. Down to Earth, Centre for Science and Environment (R).

3. Jadhav, H. & Bhosale, V.M. 1995 : Environmental Protection and Laws, Himalaya Publishing House, Delhi 284 p.

4. Mekinney, M.L. & School : R.M. 1996 : Environmental Science Systems & Solutions, Web enhanced edition 639p.

5. Wagner K.D. 1998: Environmental Management, W.B. Saunders Co. Philadelphia, USA 499p.

SCIENCE & CIVILISATION

B.A. III Year

1. **SCIENCE :**

   i) Observation Hypothesis, Experiment, theory, Proof.

   ii) Great discoveries result, from the method than man.

   iii) Modern Science: Sophisticated Equipment team work.

2. Evolution of Civilization : Paleolithic, Neolithic, Age of metals (Cooper, Bronze early from late iro) : Pre Historic, Historic (Ancient, Medieval and Moern).

3. Significant discoveries and investions with their prime areas of impact.

   i. Vaccination, Rencillia, X-rays, Antibiotics, Vitamins, Ansthesia, DDT, Detergents, Contraceptives, Radium therapy, Insulin, Cartisene, Antiseptics, etc… HEALTH.

   ii. Wheen, Compass, Surveying, Steam Engine, Automobile, Ship, Aeroplane, etc… TRANSPORT.

   iii. Radio, Telephone, Wireless, Camera, Teleprinter, Radar, Television, Satelites, etc… COMMUNICATION.

   iv. Hybridisation Green revolution, Artificial insemination, Fertilisers, Insectides, Pesticides, etc… AGRICULTURE & ANIMAL HUSBANDRY.

   v. Synthetic fibres, Electric lamp, Paper, Printing, Refrigeration, Cinema etc… SOCIAL WELLBEING.

   vi. Gunpowder, Glass, Metallurgy, Sources of energy (wood, coal, oil, electricity, atomic power) Non-conventional Sources (wind, water, solar cells, biogas, teothermal) Clock Computer, etc… INDUSTRY.

4. Relations between science and society – complementary and occasionally averse also – Capitalism leading to better means of communication to over exploit resources Warfare, Development of gunpowder, bomb, jeep, radar, ICBM, biological killers, etc.

5. Society Goals – Welfare, Freedom, Security, Social Justice.

B.Sc.

GENERAL STREAM WITH NO COMPUTER COURSE AS CORE SUBJECT

B.Sc. SECOND YEAR
OFFICE AUTOMATION TOOLS

UNIT - 1

Excel basics : The usual spread sheet features, Overview of excel features, Getting Started, Creating a new work sheet, Selecting cells, Navigating with the mouse and keyboard, Entering and editing text, text boxes, text notes, checking spelling, undoing and repeating actions, entering and formatting numbers, entering and editing formulas, referencing cells, order of evaluation in formulas, look up tables, copying entries and equations to minimize typing, more auto fill examples, creating custom fill lists, protecting and unprotecting documents and cells.

Rearranging worksheets : Moving cells, copying cells, sorting cell data, inserting rows, inserting columns, inserting cells, inserting as you paste, deleting parts of a worksheet, clearing parts of a worksheet, how formulas react to worksheet design changes, Auditing tools help spot potential problems.

Excel formatting tips and techniques : Excel page setup, Changing column widths and row heights, auto format, manual formatting, using styles, format codes alter a number's appearance, format painter speeds up format copying, changing font sizes and attributes, adjusting alignments, centering text across columns, using border buttons and commands, changing colors and shading, inserting and removing page breaks, hiding rows and columns.

Organizing large projects : Using names, splitting windows and fixing titles, outlining your worksheets, working with multiple worksheets, using multiple worksheets in a workbook, viewing multiple windows, summarizing information from multiple worksheets.

An introduction to functions : Parts of a function, functions requiring add-ins, online functions help, the function wizard, examples of functions by category, error messages from functions.

UNIT - 2

Excel's chart features : chart parts and terminology, instant charts with the chart wizard, creating charts on separate worksheets, resizing and moving charts, adding chart notes and arrows, editing charts, rotating 3-D charts, Changing worksheet values by dragging chart parts, printing charts, deleting charts, setting the default chart type, controlling with series on which axis, adding overlay charts, creating trend lines, data map.

Working with graphics in Excel : Creating and placing graphic objects, resizing graphics, positioning graphics on worksheets, drawing lines and shapes, examples of graphics in Excel, possible sources of excel graphics, Excel slide shows.

Introduction to Excel's command macros : Recording your own macros, running macros, assigning macros to buttons.

Using worksheets as databases : Database concepts and terms, Creating an excel database, Working with data forms, filtering-a better way to find, sorting excel databases, cross-tabulating databases, adding subtotals to databases.

Automating what-if projects : General organizational tips, scenario manager, finding the right number with solver.

Auditing and trouble shooting worksheets : Using error values to locate problems, using iteration to solve circular references, using the info window to find errors, using the auditing command to trouble shoot.

UNIT - 3

Introduction to Access : Access concepts and terms, starting and quitting access, the access workspace and tools, the views.

Creating a simple database and tables : The access table wizard, creating databases without the wizard, field names, data types and properties, adding or deleting fields in tables, renaming fields and their captions, moving fields, deleting fields in tables, resizing fields, changing the appearance' of text in tables, freezing columns, primary key fields, indexing fields, viewing a list of database properties.

Forms : The form wizard, saving forms, modifying forms.

Entering and editing data : Typing, adding records, duplicate previous entries without retyping, switching out of data entry mode, when do entries get saved?, undo, correcting entries, global replacements, moving from record to record in a table, entry and navigational shortcuts.

Finding, sorting and displaying data : Queries and dynasets, creating and using select queries, returning to the query design, multiple search criteria, finding incomplete matches, using wildcards in queries, requesting range of records, hiding columns, reformatting dynasets, multilevel sorts, showing all records after a query, saving queries for latter use, cross tab queries, find and replace.

UNIT - 4

Printing reports, forms, letters and labels: simple table, form, and database printing, defining advanced reports, manual reporting and modifying, modifying section contents, properties in reports, saving report formats for reuse, printing mailing labels, changing label designs.

Relational databases : Flat versus relational, how relationships work, Exercise: creating a simple relationship, types of relationships, defining and redefining relationships, deleting relationships, creating relationships.

Expressions, macros and other automation : Expressions, using expressions in reports, using expressions in queries, using expressions in forms, expression builders.

Graphics in databases : Objects: linked, embedded, bound and unbound, unbound graphics as form and report embellishments, bound graphics in records, adding graphics to buttons, chart wizard: charting your data.

Linking, importing and exporting records : Importing versus linking, linking other databases as tables, importing data from spread sheet files, importing data from word files, exporting access data.

Unit - 5

The Internet and the World Wide Web : Overview: what is Internet, The Internet's history, The Internet's major services, Understanding the world wide web, Using your browser and the world wide web,

navigating the web, closing your browser, getting help with your browser, searching the web, search results and web sites .

E-mail and other Internet Services : Overview: communicating through the Internet, Using E-mail, Using an E-mail program, Stoping out spam, Using web-based e-mail services, More features of the Internet.

Connecting to the Internet: Overview: Joining the Internet phenomenon, Connecting to the Internet through wires, How PC applications access the Internet, Connecting to the Internet wirelessly.

Doing business in the online world : Overview: commerce on the world wide web, E-commerce at the consumer level, E-conmerce at the business level, Business, the Internet and every thing, Telecommuters.

Prescribed books:

1. Ron Mansfiled, Working in Microsoft office, Tata McGraw Hill (2008) (chapters 13 to 23 and 29 to 38)

2. Peter Norton, Introduction to computers, Sixth Edition Tata McGraw Hill (2007) (Chapters 8A, 8B, 9A, 9B) .

Reference Books :

1. Michael Miller, Absolute Beginner's guide to computer Basics, Fourth Edition, Pearson Education (2007).

2. Deborah Morley, Charles S.Parker, understanding computers today and tomorrow, 11th edition, Thomson (2007).

3. Ed Bott, woody Leonhard, using Microsoft Office 2007, Pearson Education (2007).

4. Rajkamal, Internet and web Technologies, Tata McGraw Hill (2007) .

PART - II
B.Sc.

B.Sc. BOTANY (BZC)
Theory & Practicals Syllabus

FIRST YEAR

PAPER - I : Mocrobial Diversity, Cryptogams and Gymnosperms

SECOND YEAR

PAPER - II : Anatomy, Embryology, Taxonomy and Medicinal Botany

THIRD YEAR

PAPER - III : Cell Biology, Genetics, Ecology and Biodiversity

PAPER - IV : Physiology, Tissue Culture, Biotechnology, Seed Technology and Herticulture

B.Sc. BOTANY (BZC)
Theory & Practical Syllabus

FIRST YEAR

PAPER - I
MICROBIAL DIVERSITY, CRYPTOGAMS AND GYMNOSPERMS

UNIT – I : Evolution of Life and Diversity of Microbes

1. Origin and evolution of Life – an outline.

2. **Viruses :** Structure, replication and transmission; plant diseases caused by viruses and their control.

3. **Bacteria :** Structure, nutrition, reproduction and economic importance. An outline of Plant diseases of important crop plants caused by bacteria and their control.

4. Brief account of Archaebacteria, Chlamydia, Actinomycetes and Mycoplasma.

5. **Cyanobacteria :** Cell structure, thallus organisation and their prospecting (uses) – Biofertilizers. Structure and life history of *Oscillatoria, Nostoc* and *Anabaena*.

UNIT – II : Algae and Fungi

6. **Algae :** General account, thallus organisation, structure, reproduction, classification and economic importance.

7. Structure, reproduction, life history and systematic position of *Oedogonium, Coleochaete, Chara, Ectocarpus* and *Polysiphonia.*

8. **Fungi :** General characters, classification and economic importance.

9. Structure, reproduction and life history of *Albugo, Saccharomyces, Penicillium, Puccinia, Altermania*. General account of plant diseases caused by Fungi and their control.

10. **Lichens :** Structure and reproduction; ecological and economic importance.

UNIT – III : Bryophyta and Pteridophyta

11. **Bryophytes :** General characters, classification and alternation of generations.

12. Structure, reproduction, life history and systematic position of *Marchantia, Anthoceros* and *Polytrichum. Evolution* of Sporophyte in Bryophytes.

13. **Pteridophytes :** General characters, classification, alternation of generations and evolution of sporophyte.

14. Structure, reproduction, life history and systematic position of *Rhynia, Lycopodium, Equisetum* and *Marsilea.*

15. Evolution of stele, heterospory and seed habit in Pteridophytes.

UNIT – IV : Gymnosperms and Palaeobotany

16. **Gymnosperms :** General characters, structure, reproduction and classification.

17. Morphology of vegetative and reproductive parts, systemic position, life history of *Pinus* and *Gnetum*

18. Distribution and economic importance; endangered Gymnosperms.

19. **Palaeobotany :** Introduction, Fossils and fossilization; Geological time scale; Importance of fossils.

20. Bennettitales : General account

Suggested Readings:

1. Alemopolus, J. and W.M. Charles. 1988. Introduction to Mycology. Wiley Eastern, New Delhi.

2. Mckane, L. and K. Judy. 1996. Microbiology – Essentials and Applications. McGraw Hill, New York.

3. Pandey, B.P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.

4. Pandey, B.P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.

5.   Pandey, B.P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company, New Delhi.

6.   Sambamurthy, A.V.S.S. 2006. A Textbook of Plant Pathology. I.K. International Pvt. Ltd., New Delhi.

7.   Sambamurthy, A.V.S.S. 2006. A Textbook of Algae. I.K. International Pvt. Ltd., New Delhi.

8.   Sharma, O.P. 1992. Textbook of Thallophyta. McGraw Hill Publishing Co., New Delhi.

9.   Sporne, K.R. 1965. Morphology of Gymnosperms. Hutchinson Co., Ltd., London.

10. Thakur, A.K. and S.K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd. New Delhi.

11. Vashishta, P.C., A.K. Sinha and Anil Kumar. 2006. Botany – Pteridophyta (Vascular Cryptogams). S. Chand & Company Ltd, New Delhi.

12. Vashishta, B.R. A.K. Sinha and V.P. Singh. 2008. Botany for Degree Students: Algae. S. Chand & Company Ltd, New Delhi.

13. Vashishta, P.C., A.K. Singha and Anil Kumar. 2006. Botany for Degree Students: Gymnosperms. S. Chand & Company Ltd, New Delhi.

14. Vashishta, B.R. 1990. Botany for Degree Students: Fungi, S. Chand & Company Ltd, New Delhi.

15. Watson, E.V. 1974. The structure and life of Bryophytes, B.I. Publications, New Delhi.

SECOND YEAR

PAPER - II
ANATOMY, EMBRYOLOGY, TAXONOMY AND MEDICINAL BOTANY

UNIT - I: ANATOMY

1. *Meristems:* Types, histological organization of shoot and root apices and theories.

2. **Tissues** and **Tissue Systems:** Simple, complex and special tissues.

3. Leaf: Ontogeny, diversity of internal structure; Stomata and epidermal outgrowths.

4. **Stem** and **root anatomy,** Vascular cambium - Formation and function. Anomalous Secondary growth-general account. *Ex: Stem-Achyranthes, Boerhavia, Bignonia, Dracaena;* **Root-** *Beta vulgaris*

5. *Wood structure:* General account. Study of local timbers - Teak (*Tectona grandis*),Rosewood, *(albergia latifolia),* Red sandal, *(Pterocarpus santalinus)Nalamaddi, (Terminalia tomentosa (T. alat)* Peddagi *(Pterocarpus marsupiun),* and Neem *(Azadirachta indica)*

UNIT - II: EMBRYOLOGY

6. Introduction to Embryology. Anther structure, Microsporogenesis and development of male gametophyte.

7. Ovule structure and types; Megasporogenesis; types and development of female gametophyte.

8. Pollination - Types; Pollen - pistil interaction. Fertilization.

9. Endosperm - Development and types. Embryo - development and types; Polyembryony and Apomixis - an outline

10. Palynology: Pollen morphology, NPC systems, application of Palynology.

UNIT - III: TAXONOMY

11. Introduction : Principles of Plant Systematics, Systematics vs Taxonomy, Types of classification : Artificial, Natural and Phylogenetic

12. Systems of classification : Salient features and comparative account of Bentham & Hooker and Engler & Prantle. An introduction to Angiosperm Phylogeny Group (APG)

13. Current concepts in Angiosperm Taxonomy : Embryology in relation to taxonomy, Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy.

14. Nomenclature and Taxonomic resources: An introduction to ICBN, Vienna code - a brief account. Herbarium: concept, techniques and applications.

15. Systematic study and economic importance of plants belonging to the following families: Annonanceae, Capparadaceae, Rutaceae, Fabaceae (Faboideae/papilionoideae, Caesalpinioideae, Mimosoideae), Cucurbitaceae, Apiaceae, Asteraceae. Asclepiadaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae, Orchidacae and Poaceae

UNIT- IV : MEDICINAL BOTANY

16. Ethnomedicine: Scope, interdisciplinary nature, distinction of Ethnomedicine from Folklore medicine. Outlines of Ayurveda, Sidda, Unani and Homeopathic systems of traditional medicine. Role of AYUSH, NMPB, CIMAP and CDRI.

17. Plants in primary health care: Common medicinal plants - Tippateega *(Tinospora cordifolia),* tulasi *(Ocimum sanctum),* Pippallu *(piper longum),* Karaka *(Terminalia chebula),* Kalabanda *(Aloe vera),* Turmeric *(Curcuma longa.).*

18. Traditional medicine vs Modern medicine : Study of select plant examples used in traditional medicine as resource (active principles, structure, usage and pharmacological action) of modern medicine : Aswagandha *(Withania somnifera),* Sarpagandha *(Rauvolfia serpentina),* Nela usiri *(Phyllanthus amarus),* Amla *(Phyllanthus emblica)* and Brahmi *(Bacopa monnieri).*

19. Pharmacognosy : Introduction and scope, Adulteration of plant crude drugs and methods of identification - some examples. Indian Pharmacopoeia.

20. Plant crude drugs : Types, methods of collection , processing and storage practices, Evaluation of crude drugs.

SUGGESTED READINGS:

1.   Bhattacharya et. al 2007 . A text book of Palynology, Central, New Delhi.

2.   Bhojwani, S.S. and S.P. Bhatnagar, 2000. The Embryology of Angiosperms (4th Ed.), Vikas Publishing House, Delhi.

3.   Davis, P.H. and V.H. Heywood. 1963, Principles of Angiosperm Taxonomy. Oliver and Boyd, London.

5.   Esau, K. 1971. Anatomy of Seed Plants. John Wiley and Son, USA.

6.   Heywood, V.H. 1965. Plant Taxonomy, ELBS, London

7.   Heywood, V.H. and D.M. Moore (Eds). 1984. Current Concepts in Plant Taxonomy. Academic Press, London

8.   Jain, S.K. and V.Mudgal. 1999. A Handbook of Ethnobotany. Bishen Singh Mahedra Pal Singh, Dehradun.

9.   Jeffrey, C. 1982. An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge, London.

10. Johri, B.M. 1984. Embryology of Angiosperms. Springer-Verleg, Berlin.

11. Joshi, S.G. 2000. Medicinal Plants. Oxford and IBH, New Delhi.

12. Kapil, R.P. 1986. Pollination biology. Inter India Publishers, New Delhi.

13. Kokate,C. and Gokeale - Pharmacognosy - Nirali Prakashan, New Delhi.

14. Lad, V. 1984. Ayurveda — The Science of Self-healing. Motilal Banarasidass, New Delhi.

15. Lewis, W.H. and M.P.F. Elwin Lewis. 1976. Medical Botany, Plants Affecting Man's Health. A Wiley Inter Science Publication, John Wiley and Sons, New York.

16. Maheswari.P. 1971. An Introduction to Embryology of Angiosperms. McGraw Hill Book Co., London.

17. Pandey, B.P. 2007. Botany for Degree Students : Diversity of Seed Plants and their Systematics, Structure, Development and Reproduction in Flowering Plants. S. Chand & Company Ltd., New Delhi.

18. Rastogi, R.R. and B.N. Mehrotra. 1993. Compendium of Indian Medicinal Plants. Vol.1 & II.CSIR, Publication and Information Directorate, New Delhi.

19. Sivarjan, V.V. and I. Balasubramaniyan. 1994. Ayurvedic Drugs and their Plant Sources. Oxford and IBH, New Delhi.

20. Stace, C.A. 1989. Plant Taxonomy and Biostatistics (2nd Ed.). Edward Arnold, London

21. Singh, G. 1999. Plant Systematics: Theory and Practice. Oxford and IBH, New Delhi.

Practical - II :

ANATOMY, EMBRYOLOGY, TAXONOMY AND MEDICINAL BOTANY

(Total Hours of Laboratory Exercises : 90 @ 3 h/Week in 30 sessions)

Suggested Laboratory Exercises:

1. Demonstration of double staining techniques

2. Tissue organization in root and shoot apices using permanent slides

3. Preparation of double staining slides
    Primary structure: Root - *Cicer, Canna;* Stem *Tridox, Sorghum*
    Secondary structure: Root - *Tridox sp.;* Stem - *Pongamia*
    Anomalous secondary structure: *Achyranthes, Boerhavia, Bignonia, Dracaena, Beta vulgaris*

4. Stomatal types using epidermal peels

5. Microscopic study of wood in T.S., T.L.S. and R.L.S

6. Structure of anther and microsporogenesis using permanent slides

7. Structure of pollen grains using whole mounts
    (Catharanthus, Hibiscus, Acacia, Zea)

8. Pollen viability test using *in-vitro* germination
    (Catharathus)

9. Study of ovule types and developmental stages of Embryo sac.

10. Structure of endosperm (nuclear ad cellular);
    Developmental stages of dicot and monocot
    Embryos using permanent slides

11. Isolation and mounting of embryo
    (using *Cymopsis/Senna/Crotalaria*)

12. Systematic study of locally available plants
    belonging to the families prescribed in theory
    Syllabus (minimum of one plant representative for each family)

13. Demonstration of herbarium techniques and collection
    of Medicinal Plants.

13

THIRD YEAR

Paper- III :
CELL BIOLOGY, GENETICS, ECOLOGY
AND BIODIVERSITY

UNIT-I: Cell Biology

1. *Plant cell envelops:* Ultra structure of cell wall, molecular organization of cell membranes.

2. *Nucleus-* Ultrastructure, Nucleic acids - Structures and replication of DNA; Types and functions of RNA.

3. *Chromosomes:* Morphology, organization of DNA in a chromosome. Euchromatin and Heterochromatin, Karyotype.

4. *Special types of chromosomes:* Lampbrush, polytene and B - chromosomes.

5. *Cell division:* Cell cycle and its regulation ; mitoses, meiosis, and their significance.

UNIT- II: Genetics

6. *Mendelism :* Laws of inheritance. Genetic interactions - Epistasis, Complementary, Supplementary and inhibitory genes.

7. *Linkage and crossing over:* A brief account, construction of genetic maps - 2 point and 3 point test cross data.

8. *Mutations:* Chromosomal aberrations - structural and numerical changes; Gene mutations, transposable elements.

9. *Gene Expression:* Organization of gene, transcription, translation, mechanism and regulation of gene expression in prokaryotes (Eac.and Trp Operons).

10. Extra nuclear genome: Mitochondria! and plastid DNA, Plasmids.

UNIT-III: Ecology

11. Concept and components of Ecosystem. Energy flow, food chains, food webs, ecological pyramids, biogeochemical cycles Carbon. Nitrogen. Phosphours.

12. Plants and environment: Ecological factors Climatic (light and temperature), edaphic and biotic. Ecological adaptations of plants.

13. Population ecology: Natality, Mortality, growth curves, ecotypes, ecads.

14. Community ecology: Frequency, density, cover life forms, biological spectrum, Ecological succession (Hydrosere, Xerosere).

15. Production ecology: Concepts of productivity, GPP.NPP, CR (Community -- Respiration) and secondary production, P/R ration and Ecosystems.

UNIT - IV : Biodiversity and Conservation

16. Biodiversity: Concepts, Convention on Biodiversity - Earth Summit. Types of biodiversity.

17. Level, threats and value of Biodiversity.

18. Hot spots of India - endemism. North Eastern Himalayas, Western Ghats.

19. Agro-biodiversity: Vavilov centres of crop plants.

20. Principles of conservation: IUCN threat - categories, RED data book- Threatened & endangered plants of India. Role of organizations in the Conservation of Biodiversity - IUCN, UNEP, WWF, NBPGR, NBD.

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Practical- III :
CELL BIOLOGY, GENETICS, ECOLOGY
AND BIODIVERSITY
(Total Hours of Laboratory Exercises:
90 @ 3 h/Week in 30 sessions)

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Suggested Laboratory Exercises:

I.   Major Experiments

1.   Demonstration of cytochemical methods: Fixation of plant material and nuclear staining for mitotic and meiotic studies.

2.   Study of various stages of mitosis using cytological preparations of onion root tips.

3.   Study of various stages of meiosis using cytological preparation of onion flower buds

4.   Study of plant community by quadrate method

5.   Estimation of chemical oxygen demand (COD) in a given water sample.

II. Minor Experiments

6. Karyotype study using cytological preparation of dividing root tip cells of onion/photographs/permanent slides

7. Study of polytene chromosomes using salivary glands from *Chironomus /* prepared slides/ photographs.

8. Solving genetic problems related to monohybrid, dihybrid ratio and interaction of genes (Minimum of six problems in each topic). **See annexure-I**

9. Demonstration of soil texture (composition of clay, sand silt etc.) pH.

10. Estimation of water purity in given water samples

11. Estimation of OT in given water samples

12. Estimation of chlorides in given water samples

III. Scientific Observations

13. Study in the ultra structure of cell organelles using electron microphotographs.

14. Geographical spotting of certain endemic and endangered plant species of A.P.

15. Minimum of two field visits to local areas of ecological/ conservation of biodiversity Importance (Sacred grove/ Reserved Forest / Botanical garden/ Lakes etc.)

IV. Critical notes on spotters of scientific interest

16. Salivary gland chromosome
17. Lampbrush chromosome
18. Solenoid model of chromosome structure
19. Operon model
20. *Mirabilis jalapa*
21. *Eichhornia 11. Hydrilla*
23. *Pistia*
24. *Nymphaea*
25. *Vallisnaria*
26. *Asperagus*
27. *Opuntia*
28. *Euphorbia antiquorum*
29. *Rhizophora*
30. *Avecenia*

B.Sc. Botany Practical Syllabus

Paper - III
Annexure - I

Monohybrid cross:

(i)   In pea, tall plant is dominant over dwarf plant. If a homozygous tall is crossed with a dwari plant, describe (i) the genotypes and phenotypes of F_1 and F_2 progeny, (ii) the gametes produced by F_1 and (iii) the genotypes and phenotypes of test cross and back cross progeny.

(ii) In pea, yellow cotyledon is dominant over green cotyledon colour. A plant heterozygous for yellow cotyledon is crossed with a plant homozygous for green cotyledon colour. Determine the gametes produced by these plant, and the genotypes and the phenotypes of progeny obtained from their cross.

(iii) In a cross between two parents 22 plants are round and 8 plants are wrinkled. Find out the genotype of the parents involved in the above cross.

(iv) What gametes will be produced by the plants involved in the following four crosses and what will be the size of the offspring from the each cross.

    (i) TT x Tt (ii) Tt xTt (iii) TT x tt (iv) Tt x tt.

(v)   A tall plant is crossed with a dwarf plant. In the progeny, about one-half of the plants are tall and the renaming one-half dwarf. Determine the genotypes of the tall and dwarf plants.

(vi) In *Mirabilis* (Four *'O'* clock), a plant hybrid for red ® and whiter flowers ® had pink flower (Rr). A plant with pink flowers is crossed with one having red flowers and with another having white flowers. Give the genotypic and phenotypic ratios expected in progenies from these crosses.

Dihybrid cross:

(vii) A dwarf pea plant with yellow seed is crossed with a tall plant with green seeds. Give the genotype and phenotype of FI, the gametes produced by FI, the genotypes and phenotypes of p2 and testcross progeny.

(viii) In snapdragon, tall (DD) is dominant dwarf (dd) and red flowers (RR) are incompletely dominant over white (rr), the hybrid being pink. A pure tall white is crossed to a pure dwarf red and the FI are self-fertilised. Give the expected genotypes and phenotypes in F_1 and F_2

(ix) Let Y.y, S and s represent yellow, green, round and wrinkled characters of the seed of *Pisum sativum*, what will be the colour and shape of the seeds produced by the offspring of the flowing crosses : (i) YYss x yySS, (ii) Yy Ss x Yyss.

(x) In man, brown eyes (V0) are dominant to blue (b) and dark hairs ® dominant to red hairs (r). A man with brown eyes and red hairs and marries a woman with blue eyes and dark hairs. They have two children, one with brown eyes and red hairs and the other with blue eyes and dark hairs. Give the genotypes of the parents and children.

(xi) In Guinea pigs rough coat colour (R0) is dominant over smooth coat ® and black colour (B) is dominant over white (b). when two pigs are mated the following offspring are formed. 28 rough black, 31 rough white, 11 smooth black, 10 smooth white. Find out the genotypic parents involve in the mating.

(xii) In summer squash white fruit colour id governed by a dominant allele W and yellow fruit colour by its recessive w. a dominant allele had another locus (s) produces disc shaped fruit and its recessive (s) is produces sphere shaped fruit. A homozygous white disc variety of genotype WWSS is crossed with a homozygous yellow sphere variety (wwss). What are the phenotypes expected in the F_1, F_2 backcross and test cross progenies?

Gene interactions:

(xiii) A pure Rose combed chicken is mated with a pure Pea combed chicken. All the F1 Wulnut with Rose and Pea separately and how phenotypes and genotypes.

(xiv) A cross between Rose combed chicken and Walnut combed chicken produced 15 Walnut, 14 Rose, 5 Pea and 6 Single comb offspring. Determine the genotypes of the parents.

(xv) In sweet pea, genes C&P are necessary for coloured flowers. The absence of either or both of these genes the flowers are white. What will be the ratio of the offsprings of the following crosses. (i) Cc xccPp (ii) Cc x Ccpp © CcPp x CcPp.

(xvi)   Coloured flowered (purple) are dependent on dominant genes C&P. Presence of any one dominant gene fails to produce colour becoming white. A purple flowered plant is crossed with a white flowered plant. 17 Purple and 16 white flowered plants are produced. Give the genotypes of the parents.

(xvii)   In mice, black colour of hair is determined by a dominant gene C. Agouti is a wild character which is dependent on dominant gene A. this wild character is expressed when ever it interacts with coloured gene. Albino micro mice are with recessive genes. Find out the ratios of F1 & F2 offsprings resulting from a cross between black and albino mice.

(xviii) In Shepherd purse, triangular fruits are dependent either one or two dominant genes. Top shaped fruits are recessive. A cross was made between two triangular fruited plants. What will be the first shape of offsprings?

Suggested Readings :

1.   Bharucha, E. 2005. Textbook of Environmental Studies for Undergraduate Courses. Universities Press (India) Private Limited, Hyderabad.

2.   Fukui, K. and S. Nakayama. 1996. Plant Chromosomes: Laboratory Methods. CRC Press, Boca Raton, Florida.

3.   Harris, N. and K.J. Oparka. 1994. Plant Cell Biology: A Practical Approach. IRL Press at University Press. Oxford. UK.

4.   Khitoliya, R.K. 2007. Environmental Pollution - Management and Control for Sustainable Development. S. Chand & Company Ltd., New Delhi.

5.   Kormondy, E. 1989. Concepts of Ecology (3rd Ed.). Printice Hall of India, New Delhi.

6.   Kothari, A. 1997. Understanding Biodiversity: Life, Sustainability and Equity: Tracts for the Times. 11. Orient Longman Ltd., New Delhi.

7.   Michael, S. 1996. Ecology. Oxford University Press London.

8.   Mishra. D.D. 2008. Fundamental Concepts in Environmental Studies. S. Chand & Company Ltd., New Delhi.

9.   Odum, E.P. 1983. Basics of Ecology. Saunder's International Students Edition, Philadelphia.

10. Pandey. B.P. 2007. Botany for Degree Students: Diversity of Microbes, Croptogames, Cell Biology and Genetics. S. Chand & Company Ltd., New Delhi.

11. Sharma P.D. 1989. Elements of Ecology. Rastogi Publications, Meerut.

12. Sharma, A.K. and A. Sharma. 1999. Plant Chromosomes: Analysis, manipulation and Engineering. Harwood Academic Publishers, Australia.

13. Shukla, R.S. and P.S. Chandel. 2007. Cytogenetics, Evolution, Biostatistics and Plant Breeding. S. Chand & Company Ltd., New Delhi.

14. Singh, H.R. 2005. Environmental Biology. S. Chand & Company Ltd., New Delhi.

15. Snustad, D.P. and M.J. Simmons. 2000. Principles of Genetics. John Wiley & Sons, Inc., USA.

16. Strickberger, M.W. 1990. Genetics (3rd Ed). Macmillan Publishing Company.

17. Verma, P.S. and V.K. Agrawal. 2004. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company., New Delhi.

18. Verma, P.S. and V.K. Agrawal. 2006. Genetics. S. Chand & Company., New Delhi.

Paper - IV :

PHYSIOLOGY, TISSUE CULTURE, BIOTECHNOLOGY, SEED TECHNOLOGY AND HORTICULTURE

UNIT - I : Physiology (Part A)

1. *Water Relations:* Importance of waster to plant life, physical properties of water, diffusion, transport of water, ascent of sap; transpiration; Stomatal structure and movements.

2. *Mineral Nutrition:* Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency; absorption of mineral ions; passive and active transport.

3. *Enzymes:* Nomenclature, characteristics, regulation of enzyme action.

4. *Photosynthesis:* Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron

transport and evolution of oxygen; photophosphorylation; Carbon assimilation pathways: C3, C4 and CAM; photorespiration.

5. *Translocation of organic substance:* Mechanism of phloem transport; source-sink relationships.

UNIT - II : Physiology (Part - B)

6. *Respiration:* Aerobic and Anaerobic; Glycolysis, Kreb cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.

7. *Nitrogen Metabolism :* Biological nitrogen fixation, nitrate reduction, ammonia assimilation, amino acid synthesis and protein synthesis.

8. *Lipid Metabolism :* Structure and functions of lipids; conversion of lipids to carbohydrates, ß-oxidation.

9. *Growth and Development :* Definition, phases and kinetics of growth. Physiological Effects of phytohormon- auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids; Physiology of flowring and photoperiodism, role of phytochrome in flowing.

10. *Stress physiology:* Concept and plant response to water, salt and temperature stresses.

UNIT - II : Tissue Culture and Biotechnology

11. Tissue culture: Introduction, sterilization procedures, culture media - composition and preparation; explants.

12. Callus culture; cell and protoplast culture. Somatic hybrids and cybrids.

13. Applications of tissue culture: Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds.

14. Biotechnology: Introduction, history and scope.

15. rDNA technology: Vectors and gene cloning and transgenic plants.

UNIT - IV : Seed Technology and Horticulture

16. Seed: Structure and types. Seed dormancy; causes and methods of breaking dormancy.

17. Seed storage: Seed banks, factors affecting seed viabiligy, genetic erosion. Seed production technology; seed testing and certification.

18. Horticulture techniques: Introduction, Cultivation of ornamental and vegetable Crops, Bonsai and landscaping.

19. Floriculture: Introduction. Imporazance of green house, polyhouse, mist chamber, shade nets; Micro irrigation systems. Floriculture potential and its trade in India.

20. Vegetative Propagation of plants: Stem, root and leaf cuttings. Layering and bud grafting. Role of plant growth regulators in horticulture.

Practical - IV :

PHYSIOLOGY, TISSUE CULTURE, BIOTECHNOLOGY, SEED TECHNOLOGY AND HORTICULTURE

(Total Hours of Laboratory Exercises : 90 @ 3 h/Week in 30 sessions)

Suggested Laboratory Exercises:

I.   Major Experiments

1. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of *Rhoeo / Tradenscantia.*

2. Determination of stomatal frequency using leaf epidermal peeling.

3. Separation of chloroplast pigments using paper chromatography technique.

4. Estimation of protein by biuret method.

5. Estimation of DNA

II.   Minor Experiments

6. Determination of rate of transpiration using cobalt chloride method.

7. Determination of catalase activity using plant material/photographs.

8. Demonstration of seed dressing using fungicide to control diseases.

9. Demonstration of seed dressing using biofertiliser *(Rhizobium)* to enrich nutrient supply.

10. Demonstration of Micropropagation using explants like axillary buds and shoot meristems.

11. Testing of seed viability using 2,3,5 - triphenyl tetrazolium chloride (TTC).

III. Scientific Observations

12. Study of mineral deficiency symptoms using plant material / photographs.

13. Study of non-dormant seed germination: Breaking of seed dormancy caused by hard seed coat using scarification technique.

14. Demonstration vegetative plant propagation: Rooting of cutting-Leaf and stem: layering: stem net, glass house and mist chamber.

15. Study of the applications of plant growth regulator (IBA) for rooting of cuttings using Ornamental plants.

16. Study of protocols and photographs/charts related to Plant biotechnology: Isolation of nuclear and plasmid DNA, separation of DNA by gel electrophoresis.

17. Study visits to places of horticultural and biotechnological interest-Commercial nurseries/Botanical gardens; Biotechnology R&D laboratories/Industries.

IV. Critical notes on spotters of scientific interest.

18. Rake	19. Hoe	20. Spade
21. Trowel	22. Digger	23. Pick-axe
24. Shade net (photo)	25. Glass house (picture)	26. Mist chamber (picture)
27. Antibiotics	28. Vaccines	29. Biofertiliers
30. Single Cell Protein	31. Cosmetics	32. Multiple shoots
33. Somatic embryos	34. Artificial/Synthetic seeds	

Suggested Readings :

1. Adams, C.R., K.M. Banford and M.P. Early. 1993. Principles of Horticulture. Butterworth Heineman Ltd., London.

2. Agarwal, P.K. 1993. Hand Book of Seed Technology. Dept. of Agriculture and Cooperation. National Seed Corporation Ltd., New Delhi.

3. Balasubramanian, D., C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman. 2004. Biotechnology. Universities Press (India) Private Ltd., Hyderabad.

4. Bedell. Y.E. Seed Science and Technology. Indian Forest Species. Allied Publishers Ltd., New Delhi.

5. Channarayappa. 2007. Molecular Biotechnology – Principles and Practices. Universities Press (India) Private Ltd., Hyderabad.

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B.Sc.
CHEMISTRY

FIRST YEAR

PAPER - I   :   1)   Inorganic Chemistry - I
2)   Physical Chemistry - I
3)   Organic Chemistry - I
4)   General Chemistry - I

SECOND YEAR

PAPER - II   :   1)   Inorganic Chemistry - II
2)   Organic Chemistry - II
3)   Physical Chemistry - II
4)   General Chemistry - II

THIRD YEAR

PAPER - III   :   1)   Inorganic Chemistry - III
2)   Organic Chemistry - III
3)   Physical Chemistry - III

PAPER - IV   :   1)   Physio Chemical Methods of Analysis

2)   Drugs, Cormulations, Pesticide and Green Chemistry

3)   Macromolecules and Catalysis

B.Sc. Chemistry

FIRST YEAR

PAPER - I

UNIT - I : Inorganic Cheistry - I

1. **s-block elements :** General characteristics of groups I & II elements, diagonal relationship between Li & Mg, Be & Al.

2. **p-block elements :**

    General characteristics of elements of groups 13, 14, 15, 16 and 17

    Group-13 : Synthesis and structure of diborane and higher boranes (B_4H_{10} and B_5H_9), boron-nitrogen compounds ($B_3N_3H_6$ and BN)

    Group-14 : Preparation and applications of silanes and silicones, graphitic compounds.

    Group-15 : Preparation and reactions of hydrazine, hydroxylamine, phosphazenes.

    Group-16 : Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.

    Group-17 : Inter halogen compounds and pseudo halogens

3. **Organometallic Chemistry**

    Definetion and classification of organometallic compounds, nomenclature, preparation, properties and applications of alkyls of 1, 2 and 13 group elements.

UNIT-II : Organic Chemistry-I

1. **Structural theory in Organic Chemistry**

    Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O, NH_3 & $AlCl_3$).

    Bond polarization : Factors influencing the polarization of covalent bonds, electro negativity - inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect,

application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes.

Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples (mechanism not required).

2. Acyclic Hydrocarbons

alkanes- IUPAC Nomenclature of Hydrocarbons. Methods of preparation: Hydrogenation of alkynes and alkenes, Wurtz reaction, Kolbe's electrolysis, Corey- House reaction. Chemical reactivity - inert nature, free radical substitution mechanism. Halogenation example- reactivity, selectivity and orientation.

Alkenes - Preparation of alkenes (a) by dehydration of alcohols (b) by dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2 dihalides (brief mechanism), Saytzeff rule. Properties: Addition of hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX, Markovnikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti - Markovnikov's addition). Oxidation - hydroxylation by $KMnO_4$, OsO_4, peracids (via epoxidation) hydroboration, Dienes - Types of dienes, reactions of conjugated dines - 1,2 and 1,4 addition of HBr to 1,3 - butadiene and Diel's - Alder reaction.

Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Acidity of acetylenic hydrogen (formation of Metal acedtylides). Preperation of higher acetylenes, Metal ammonia reductions Physical properties. Chemical reactivity - electrophilic addition of X_2, HX, H_2O (Tautomerism), Oxidation with $KMnO_4$, OsO_4, reduction and Polymerisation reaction of acetylene.

3. Alicyclichydrocarbons (Cycloalkanes)

Nomenclature, Preparation by Freunds methods, heating dicarboxylic metal salts. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

4. **Benzene and its reactivity**

   Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene.

   Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Napthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation)

   Reactions - General mechanism of electrophilic substitution, mechanism of nitration. Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i). Amino, methoxy and methyl groups (ii). Carboxy, nitro, nitrile, carbonyl and Sulfonic acid groups. (iii). Halogens (Explanation by taking minimum of one example from each type).

5. **Polynuclear Hydrocarbons -**

   Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Any two methods of preparation of naphthalene and reactivity. Reactivity towards electrophilic substitution. Nitration and sulfonation as examples.

UNIT - III : Physical Chemisty-I

I   Gaseous state

   Compression factors, deviation of real gases from ideal behavior. Van der Waal's equation of state. P-V Isotherms of real gases, Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. The van der Waal's equation and the critical state. Relationship between critical constants and van der Waal's constants. The law of corresponding states and reduced equation of states. Joule Thomson effect. Liquefaction of gases: i) Linde's method and ii) Claude's method.

II   Liquid state

   Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into

Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

III   Solid state

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravis lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Determination of crystal structure by Bragg's method and the power method. Indexing of planes and structure of NaCl and KCl crystals. Defects in crystals. Stoichiometric and non-stoichiometric defects. Band theory of semoconductors. Extrinsic and intrinsic semiconductors, n- and p-type semiconductors and their applications in photo electrochemical cells.

IV   Solutions

Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions. Henry's law. Non-ideal solutions. Vapour pressure - composition and vapour pressure-temperature curves. Azeotropes-HCl-H_2O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water, trimethylamine-water, nicotine-water systems. Effect of impurity on consulate temperature. Immiscible liquids and steam distillation.

Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

V   Colloids and surface chemistry

Definition of colloids. Solids in liquids (sols), preparation, purifications, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid. Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses.

Adsorption: Physical adsoption, chemisorption. Freundlich, Langmuir adsorption isotherms. Applications of adsorption

UNIT - IV : General Chemistry - I

1.   Atomic Structure and elementary quantum mechanics

Blackbody radiation, Planck's radiation law, photoelectric effect, Compton effect, de Broglie's hypothesis, Heisenberg's uncertainty

principle. Postulates of quantum mechanics. Schrodinger wave equation and a particle in a box, energy levels, wave functions and probability densities. Schrodinger wave equation for H-atom. Separation of variables, Radial and angular functions, hydrogen like wave functions, quantum numbers and their importance.

2. **Chemical Bonding**

Valence bond theory, hybridization, VB theory as applied to CIF_3, BrF_5, $Ni(CO)_4$, XeF_2. Dipole moment - orientation of dipoles in an electric field, dipole moment, induced dipole moment, dipole moment and structure of molecules. Molecular orbital theory - LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, HCl, CO and NO). Comparision of VB and MO theories.

3. **Stereochemistry of carbon compounds**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Stereoisomerism, Stereoisomers: enantiomers, diastereomers- definition and examples. Conformational and configurational isomerism- definition. Conformational isomerism of ethane and n-butane.

Enantiomers: Optical activity- wave nature of light, plane polarised light, interaction with molecules, optical rotation and specific rotation. Chiral molecules- definition and criteria= absence of plane, center, and Sn axis of symmetry- asymmetric and disymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans - 1,2-dichloro cyclopropane).

Chiral centers: definition- molecules with similar chiral carbon (Tartaric acid), definition of mesomers- molecules with dissimilar chiral carbons (2,3- dibromopentane). Number of enantiomers and mesomers- calculation.

D.L. and R.S configuration for asymmetric and disymmetric molecules. Cahn-Ingold-Prelog rules. Racemic mixture- racemisation and resolution techniques.

Diastereomers: definition- geometrical isomerism with reference to alkenes- cis, trans and E,Z- configuration.

4. **General Principles of Inorganic qualitative analysis**

Solubility product, common ion effect, characteristic reactions of anions, elimination of interfering anions, separation of cations into groups, group reagents, testing of cations

LABORATORY COURSE - I

Practical Paper - I : Inorganic Chemistry)

Qualitative Analysis and Inorganic preparations :

Analysis of mixtures containing two anions (one simple and one interfering)and two cations (of different groups) from the following:

Anions: Carbonate, sulfide, sulphate, chloride, bromide, iodide, acetate, nitrate, oxalate, tartrate, borate, phosphate, arsenate* and chromate*.

Cations: Lead, copper, bismuth, cadmium, tin, antimony, iron, aluminum, zinc, manganese, nickel, cobalt, calcium, strontium, barium, potassium and ammonium.

*not to be given for examination.

Preparations: Any three of the following inorganic preparations:

1) Ferrous ammonium sulphate
2) Tetrammine copper (II) sulphate
3) Potassium trisoxalato chromate
4) Potash alum $KAl(SO_4)_2. 12H_2O$
5) Hexammine cobalt (III) chloride.

SECOND YEAR

PAPER - II

UNIT - I : Inorganic Chemistry - I

I. **Chemistry of d-block elements :** Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states and e.m.f. Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu triods in respect of electronic configuration and reactivity of different oxidation states.

II. **Chemistry of f-block elements:** Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties, spectral properties and separation of lanthanides by ion exchange and solvent extraction methods. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, position of actinides in the periodic table, comparison with lanthanides in terms of magnetic properties, spectral properties and complex formation.

III. **Theories of bonding in metals :** Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

IV. **Metal carbonyls and related compounds** - EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni. Metal nitrosyls and metallocenes (only ferrocene).

UNIT - II : Organic Chemistry - II

1. **Halogen compounds**

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl halides.

Chemical Reactivity, formation of RMgX

Nucleophilic aliphatic substitution reaction-classification into SN^1 and SN^2.

Energy profile diagram of S_N1 and S_N2 reactions. Stereochemistry of S_N2 (Walden inversion) S_N1 (Racemisation). Explanation of both by taking the example of optically active alkyl halide - 2bromobutane. Ease of hydrolysis - comparision of alkyl, benzyl, alkyl, vinyl and allyl halides

2. Hydroxy compounds

Nomenclature and classification of hydroxy compounds.

Alcohol: Preparation with hydroboration rection, Grignard synthesis of alcohols.

Phenols : Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene.

Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubility in water.

Chemical properties :

a. acidic nature of phenols.
b. formation of alkoxides/phenoxides and their reaction with RX.
c. replacement of OH by X using PCl_5, PCl_3, PBr_3, $SOCl_2$ and with $HX/ZnCl_2$.
d. esterification by acids (mechanism).
e. dehydration of alcohols.
f. oxidation of alcohols by CrO_3, $KMnO_4$
g. special reaction of phenols: Bromination, Kolbe-Schmidt reaction, Riemer-Tiemann reaction, Fries rearrangement, Azocoupling.

Identification of alcohols by oxidation with $KMnO_4$, ceric ammonium nitrate, lucas reagent and phenols by reaction with $FeCl_3$.

Polyhydroxy compounds: Pinacol-Pinacolone rearrangement.

3. Carbonyl compounds

Nomenclature of aliphatic and aromatic carbonyl compounds, structure of the carbonyl group.

Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3- dithianes, synthesis of ketones from nitriles and from carboxylic acids.

Physical properties: absence of hydrogen bonding, keto-enol tautomerism, reactivity of carbonyl group in aldehydes and ketones.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN, c) RMgX, d) NH_2OH, e) $PhNHNH_2$, f) 2,4 DNPH, g) Alcohols-formation of hemiacetal and acetal.

Halogenation using PCl_5 with mechanism.

Base catalysed reactions: a) Aldol, b) Cannizzaro reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel reaction.

Oxidation of aldehydes- Baeyer- Villiger oxidation of ketones.

Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$.

Analysis of aldehydes and ketones with a) 2,4-DNP test, b) Tollen's test, c) Fehling test, d) Schiff test, e) Haloform test (with equation).

4. **Carboxylic acids and derivatives**

Nomenclature, classification and structure of carboxylic acids.

Methods of preparation by
a) hydrolysis of nitriles, amides and esters.
b) carbonation of Grignard reagents.

Special methods of preparation of aromatic acids by
a) oxidation of side chain.
b) hydrolysis by benzotrichlorides
c) Kolbe reaction

Physical properties: Hydrogen bonding, dimeric association, acidity-strength of acids with examples of trimethyl acetic acid and trichloroacetic acid. Relative differences in the acidities of aromatic and aliphatic acids.

Chemical properties: Reactions involving H, OH and COOH groups-salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell-Volhard-Zelinsky reaction

Derivatives of carboxylic acids: Reaction of acid chlorides, acid anhydrides, acid amides, esters (mechanism of the hydrolysis of esters by acids and bases).

5. **Active methylene compounds**

Acetoacetic esters: preparation by Claisen condensation, keto-enol tautomerism. Acid hydrolysis and ketonic hydrolysis.

hydrolysis and ketonic hydrolysis.

Preparation of
a) monocarboxylic acids
b) dicarboxylic acids.

Reaction with urea
Malonic ester: preparation from acetic acid.
Synthetic applications: Preparation of
    a) monocarboxylic acids (propionic acid and n-butyric acid).
    b) dicarboxylic acids (succinic acid and adipic acid).
    c)   -unsaturated carboxylic acids (crotonic acid).

Reaction with urea.

6. **Exercises in interconversion**

UNIT - III : Physical chemistry - II

1. **Phase rule**

Concept of phase, components, degree of freedom. Definition of Gibbs phase rule. Phase equilibrium of one component - water system. Phase equilibrium of two-component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, desilverisation of lead. Solid solutions- compound with congruent melting point- (Mg-Zn) system, compound with incongruent melting point - NaCl- water system. Freezing mixtures.

2. **Dilute solutions**

Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Theory of dilute solutions. Determinattion of

molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties. Van't Hoff factor, degree of dissociation and association.

3.   Electrochemistry

Specific conductance, equivalent conductance, measurement of equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorf's method. Application of conductivity measurements-determination of dissociation constant (K_a) of an acid, determination of solubility product of sparingly soluble salt, conductometric titrations.

Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble salt and redox electrodes. Electrode reactions, Nernst equation, single electrode potential, standard Hydrogen electrode, reference electrodes, standard electrode potential, sign convention, electrochemical series and its significance. Reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurements. Computation of cell EMF. Applications of EMF measurements, Calculation of thermodynamic quantities of cell reactions (G, H and K). Determination of pH using quinhydrone electrode, Solubility product of AgCl. Potentiometric titrations.

UNIT - IV : General Chemistry - II

1.   Molecular summetry

Concept of symmetry in chemistry-symmetry operations, symmetry elements. Rotational axis of symmetry and types of rotational axes. Planes of symmetry and types of planes. Improper rotational axis of symmetry. Inversion centre. Identity element. The symmetry operations of a molecule form a group. Flow chart for the identification of molecular point group.

2.   Theory of quantitative analysis

a   Principles of volumetric analysis. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations, choice of indicators for these titrations.

b) Principles of gravimetric analysis: precipitation, coagulation, peptization, coprecipitation, post precipitation, digestion, filtration and whashing of precipitate, drying and ignition, precipitation from homogenous solutions, requirements of gravimetric analysis.

3. Evalution of analytical data

Theory of errors, idea of significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision - methods of expressing precision, standard deviation and confidence limit.

4. Introductory treatment to:

a) Pericyclic Reactions

Concerted reactions, Molecular orbitals, Symmetry properties HOMO, LUMO, Thermal and photochemical pericyclic reactions. Types of pericyclic reactions - electrocyclic, cycloaddition and sigmatropic reactions - one example each.

b) Synthetic strategies

Terminology - Disconnection (dix), Symbol ( ), synthon, synthetic equivalent (SE), Functional group interconversion (FGI), Linear, Convergent and Combinatorial syntheses, Target molecule (TM). Retrosynthesis of the following molecules
a) acetophenone 2) cyclohexene 3) phenylethylbromide

c) Asymmetric (Chiral) synthesis

Definitions-Asymmetric synthesis, enantiometric excess, diastereometric excess. stereospecific reaction, definition, example, dehalogenation of 1,2-dibromides by I, stereoselective reaction, definition, example, acid catalysed dehydration of 1-phenylpropanol

LABORATORY COURSE - II

Practical Paper - II : Inorganic Chemistry)

I. Titrimetric analysis :

1) Determination of carbonate and bicarbonate in a mixture

2) Determination of Fe(II) using $K_2Cr_2O_7$

3) Determination of Fe(II) using $KMnO_4$ with oxalic acid as primary standard.

4) Determination ofCu(II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard

5) Determination of Zinc using EDTA

6) Determination of hardness of water

7) Determination of Zinc by ferrocyanide

II. Gravimetric analysis (any three of the following)

1) Determination of barium as barium sulphate

2) Determination of sulphate as barium sulphate

3) Determination of lead as lead chromate

4) Determination of nickel as Ni-DMG complex

5) Determination of magnesium as magnesium pyrophosphate.

THIRD YEAR

PAPER - III

UNIT - I : Inorganic Chemistry - III

I.   **Coordination Chemistry :** IUPAC nomenclature, bonding theories review of Werner's theory and Sidgwick's concept of coordination, Valence bond theory, geometries of coordinatiaon numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal filed theory, splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes - low spin and high spin complexes - factors affecting crystal - field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds - structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

2.   Spectral and magnetic properties of metal complexes: Electronic absorption spectrum of $(Ti(H_2O)6)^{3+}$ ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility - Gouy method.

3.   Reactivity of metal complexes: Labile and inert complexes, ligand substitution reactions - S_N1 and S_N2, substitution reactions of square planar complexes - Trans effect and applications of trans effect.

4.   Stability of metal complexes: Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

5.   Hard and soft acids bases (HSAB) : Classification, Pearson's concept of hardness and softness, application of HSAB principles - Stability of compounds / complexes, predicting the feasibility of a reaction.

6.   Bioinorganic chemistry : Essential elements, biological significance of Na, K, Mg, Ca, Fe and Chloride (Cl). Metalloporphyrins - Hemoglobin, structure and funtion, chlorophyll, structure and role in photosynthesis.

UNIT - II : Organic Chemistry-III

1.   **Nitrogen compounds**

     Nitro hydrocarbons : Nomenclature and classification - Nitro hydrocarbons - structure. Tautomerism of nitroalkanes leading to

acid and keto form. Preparation of Nitroalkanes. Reactivity - Halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction.

Amines (aliphatic and aromatic): Nomenclature, Classification into 1^0, 2^0, 3^0. Amines and Quarternary ammonium compounds. Prepaative methods-1. Amonolysis of alkyl halides. 2. Gabriel synthesis. 3. Hoffman's bromamide reduction reaction (mechanism). 4. Reduction of Amides and Schmidt reaction. Physical properties and basic character Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline - comparative basic strength of aniline, N-methylaniline and N,N-dimethyl aniline (in aqueous and non-aquous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation e) reaction with nitrous acid of 1^0, 2^0,3^0 (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines - Bromination and Nitration oxidation of aryl and 3^0 amines.Diazotization Cyanides and isocyanides: Nomenclature (Aliphatic and aromatic) structure. preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iiI) reduction iv) oxidation.

2. **heterocyclic compounds**

Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring system - presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character - 6-electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions.

Resonance structures: Indicating electron surplus carbons and electron deficient heteroatom. Explanation of feebly acidic character of pyrrole, electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4-

dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity - Aromaticity - Comparison with pyrrole - one method of preparation and properities - Reactivity toward Nucleophilic substitution reaction - chichibabin reaction.

3. **Carbohydrates**

Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and D(-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acid). Number of optically active isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (no proof for configuration is required). Evidence for cyclic structure of glucose. Decomposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformation formula). Structure of fructose: Evidence of 2-ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give --carboxy-n-hexane). Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure of fructose (Furanose structure and Hawroth formula).

Interconversion of Monosaccharides: Aldopentose to aldo hexose-eg: Arabinose to D-Glucose, D-Mannose (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose eg: D-glucose to D-arabinose by Ruff's degadation. Aldohexose (+) (glucose) to ketohexose (-) (Fructose) and Ketohexose (Fructose) to aldohdexose (Glucose).

4. **Amino acids and proteins**

Introduction : Definition of Amino acids, classification of Amino acids into alpha, beta, and gama amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis : General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, Valine and Leucene)

by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis.

Physical properties : Optical activity of naturally occurring amino acids: L-configuration, irrespective of sign rotation, Zwitterion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

5. **Mass Spectrometry :**

Basic principles - Molecular ion / parent ion, fragment ions / daughter ions. Theory formation of parent ions. Representation of mass spectrum. Identification of parent ion, $(M + 1)$, $(M + 2)$, base peaks (relative abundance 100%). Mass spectra of ethylbenzene, acetophenone, n-butylamine and 1-propanol

UNIT - III : Physical Chemistry - III

1. **Chemical kinetics**

Rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Experimental methods to determine the rate of reaction. Definition of order and molecularity. Derivation of rate constants for first, second and zero order reactions and examples. Derivation for half life period. Methods to determine the order of reactions. Effect of temperature on rate of reaction Arrhenius equation, concept of activation energy. Theories of reaction rates-collision theory-derivation of rate constant for biomolecular reaction. The transition state theory (Elementary treatment).

2. **Photochemistry**

Difference between thermal and photochemical processes. Laws of photochemistry-grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Photochemical hydrogen-chlorine, hydrogen-bromine reaction. Jablonski diagrm depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative process (internal conversion, intersystem crossing). Photosensilized reactions - energy transfer processes (simple example).

3. **Thermodynamics**

The first law of themodynamics : Statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule's law Joule-Thomson effect and coefficient. Calculation of w, q, dE and dH for the expansion of perfect gas under Isotherm and Adiabatic conditions for reversible processes. State function. Temperature dependence of enthalpy of formation-Kirchoff's equation.

Second law of thermodynamics : Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy changes in cyclic, reversible, and irreversible processes and reversible phase change. Calculation of entropychanges with changes in V & T and P & T. Entropy changes in spontaneous and equilibrium processes.

The Gibbs (G) and Helmholtz (A) energies. A & G as criteria for thermodynamic equilibrium and spontaneity-advantage over entropy change. Gibbs equation and Variation of G with P and T.

PAPER - IV :
CHEMISTRY AND INDUSTRY

UNIT - I : Physico Chemical Methods of analysis

1. **Seperation Techniques**

1. Chromatography : Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values.

   a) Paper chromatography : Principles, Rf Values, Experimental procedures, choice of paper and solvent systems, development of chromatogram - ascending, descending and radial. Two dimensional chromatography, applications.

   b) Thin layer Chromatography (TLC): Advantages. Principles, factors effecting Rf values. Experiment procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications.

   c) Column Chromatigraphy : Principle, experimental procedures, Stationary and mobile Phase, Separation technique. Applications.

2. **Spectrophotometry**

   General features of absorption - spectroscopy , Beer-Lambert's law and its limitations, trasmittance, Absorbance, and molar absorptivity.

Double beam spectrophotometer. Application of Beer-Lambert law for quantitative analysis of

1. Chromium in $K_2Cr_2O_7$
2. Mangnanese in $KMnO_4$
3. Iron (III) with thiocyanate.

3. **Molecular spectroscopy**

   (i) Electronic spectroscopy :

   Interaction of electromagnetic radiation with molecules and types of molecular spectra. Potential energy curves for bonding and antibonding molecular orbitals. Energy levels of molecules (n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore.

   (ii) Infra red spectroscopy

   Energy levels of simple harmonic oscillator, molecular vibration spectrum, selection rules. Determination of force constant. Qualitative relation of force constant to bond energies. Modes of vibrations in like CO CO_2 & H_2O molecules. Characteristic absorption bands of various functional groups. Finger Print nature of infrared specturm.

   (iii) Proton magnetic resonance spectroscopy (^{1}H-NMR)

   Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethonol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

   (iv) Spectral interpretation

   Interpretation of IR, UV-Visible, ^{1}H-NMR and mass spectral data of the following compounds 1. Phenyl acetylene 2. Acetophenone 3. Cinnamic acid 4. Para-nitro aniline.

UNIT - II : Drugs, formulations, pesticides and green chemistry

1. **Drugs**

   1. Introduction: Drug, Disease (definition), Historical evolution, Sources - Plant, Animal synthetic, Biotechnology and human gene therapy

2. Terminology: Pharmacy, Pharmocology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors - brief teartment) Metabolites and anti metabolites.

3. Nomenclature: Chemical name, Generic name and trade names with examples.

4. Classification: Classification based on structures and therapeutic activity with one example each.

5. Synthesis: Synthesis and therapeutic activity of the following drugs., L-Dopa, chloroquin, Omeprazole, Albuterol and ciprofloxacin.

6. Drug Development : Pencillin, Separation and isolation, structures of different pencillins.

7. Monographs of drugs: Eg Paracetamol, Sulpha methoxazole (Tablets).

2. Formulations

1. Need of conversion of drugs into medicine. Additives and their role (Brief account only)

2. Different types of formulations.

3. Green Chemistry

Introduction : Definition of green Chemistry, need of green chemistry, basic principles of green chemistry.

Green synthesis : Evalution of the type of the reation i) Rearrangements (100% atom economic), (ii) Addition reaction (100% atom economic), pericyclic reactions (No by-product).

Selection of solvent :

i) Aqueous phase reactions ii) reactions in ionic liquids iii) Solid supported synthesis iv) Solvent free reactions (solid phase reactions)

Microwave and Ultrasound assisted green synthesis :

1) Aldol condensation
2) Cannizzaro reaction
3) Diels-Alder reactions
4) Strecker synthesis

5) Willaimson synthesis

6) Dieckmann condensation

UNIT - III: (polymers, material science, and catalysis)

1. **Polymers**

   Classification of polymers, chemistry of polymerization, chain polymerization, step polymerization, coordination polymerization - tacticity (isotactic, syndiotactic, atactic poly propelene). Molecular weight of polymers - number average and weight average molecular weight, degree of polymerization, determination of molecular weight of polymers by viscometry, Osmometry : mechanism of free radical polymerization, Preparation and industrial application of polyethylene, PVC, Teflon, polyacrylonitrile, terylene and Nylon-66.

2. **Material Science :**

   Properties and applications of nano-materials.

3. **Catalysis**

   Homogeneous and heterogeneous catalysis, comparison with examples. Kinetics of specific acid catalyzed reactions, inversion of cane sugar. Kinetics of specific base catalyzed reactions base catalyzed conversion of acetone to diacetone alcohol. Acid and base catalyzed reactions hydrolysis of esters, mutarotation of glucose. Enzyme catalysis: Classification, characteristics of enzyme catalysis. Kinetics of enzyme catalyzed reactions-Michael's Menten law, significance of Michael's constant (K_m) and maximum velocity (V_{max}). Factors affecting enzyme catalysis effect of temperature, pH, concentration and inhibitor. Catalytic efficiency, Mechanism of oxidation of ethanol by alcohol dehydrogenase.

LABORATORY COURSE - III

Practical Paper - III : Organic Chemistry

I.   Synthesis of Organic Compounds

i.   Aromatic electrophilic substitution Nitration: Preparation of nitro benzene and p-nitro acetanilide, Halogenation: Preparation of p-bromo acetanilide and 2,4,6- tribromo phenol.

ii.   Diazotization and coupling: Preparation of pheyl azo   -napthol

iii. Oxidation: Preparation of benzoc acid frombenzyl chloride

iv.   Reduction: Preparation of m-nitro aniline from m-dinitro benzene

v.   Esterfication: Preparation of methyl para nitro benzoate from p-nitro Benzoic Acid.

vi.   Methylations : Preparation of   -napthyl methyl ether

vii. Condensation: Preparation of benzilidine aniline

2.   Thin layer Chromatography

i.   Preparation of the TLC plates. Checking the purity of the compounds by TLC.

ii.   Seperation of ortho and p-nitro aniline mixture by column chromatography.

3.   Organic Qualitative Analysis :

i.   Identification of an organic compound through the functional group analysis. Determination of melting point and preparation of suitable derivatives.

   i. Aniline+Naphthalene   ii. Benzoicacid+Benzophenone.
   iii. p-cresol-chlorobenzene

ii.   Separation of two component mixture Benzoic acid+benzophenone

4.   Demonstration experiments

   1. Steam distillation experiment: Separation of ortho and para nitro phenols 2) Microwave assisted Green synthesis, two example: 1. Hydrolysis of Benzamide 2. Oxidation of Toluene.

LABORATORY COURSE - IV

Practical Paper - IV : Physical Chemistry

1. **Chemical Kinetics**

   i. Kinetic study of Acid Catalyzed hydrolysis of methyl acetate and determination of rate constant - Graphical method.

   ii. Kinetic study of Acid catalysed Acetone - Iodine reaction and determination of rate constant - Graphical method.

   iii. Kinetic study of persulphate iodide reaction and determination rate constant - Graphical method

2. **Distribution law**

   i. Determination of distribution coefficient of iodine between water and carbon Tetrachloride.

   ii. Determination of molecular state and partition coefficient of benzoic acid in Toluene and water.

3. **Electrochemistry**

   i. Determination of concentration of HCl conductometrically using standard NaOH solution.

   ii. Determination of concentration of acetic acid conductometrically using standard NaOH solution.

   iii. Determination of solubility and solubility product of $BaSO_4$.

   iv. Determination of redox potentials of Fe2+ by potentiometric titration of ferrous ammonium sulphate vs. $KMnO_4$.

4. **pH metry**

   i. Preparation of phosphate buffer solutions

   ii. pH metric titration of weak acid, acetic acid with strong base NaOH and calculation of dissociation constant.

5. **Colorimetry**

   i. Verification of Beer-Lambert law for $KMnO_4 K_2Cr_2O_7$ and determination of concentration of the given solution

ii. Verification of Beer-Lambert law for $CuSO_4$ and determination of concentration of the given solution.

6. Adsorption

i. Surface tension and viscosity of liquids

ii. Adsorption of acetic acid on animal charcoal, verification of Freundlich isotherm

7. Project work :

i. Collection of spectral data of a minimum of six compounds belonging to different functional groups and submission of the report. (other than those included in the syllabus)

Note : Apart from the experiments (1 to 6) the project work (7) shall also be included in the University Examination.

Recommended Text Books and Reference Books :

Inorganic Chemistry

1. Concise Inorganic Chemistry by J.D. Lee
2. Basic Inorganic Chemistry by Cotton and Wilkinson
3. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
4. Inorganic Chemistry by R R Heslop and P.L. Robinson
5. Modern Inorganic Chemistry by C F Bell and K A K Lott
6. University Chemistry by Bruce Mohan
7. Qualitative Inorganic analysis by A.I. Vogel
8. A textbook of qualitative inorganic analysis by A.I. Vogel.
9. Inorganic Chemistry by J.E. Huheey
10. Inorganic Chemistry by Chopra and Kapoor
11. Coordination Chemistry by Basalo and Johnson
12. Organometallic Chemistry - An introduction by R.C. Mehrotra and A. Singh
13. Inorganic Chemistry by D.F. Shriver, P.W. Atkins and C.H. Langford
14. Inorganic Chemistry by Philips and Williams, Lab Manuals
15. Introduction to inorganic reactions mechanisms by A.C. Lockhart
16. Theoretical inorganic chemistry by McDay and J. Selbin
17. Chemical bonding and molecular geometry by R.J. Gillepsy and P.L. Popelier

18. Advanced Inorganic Chemistry By Gurudeep Raj

19. Analytical chemistry by Gary D Christian, Wiley India.

20. Analytical Chemistry by G.L. David Krupadanam, et al, Univ. Press

21. Selected topics in inorganic chemistry by W.D. Malik, G.D. Tuli, R.D. Madan

22. Concepts and models of Inorganic Chemistry by Bodie Douglas, D. McDaniel and J. Alexander

23. Modern Inorganic Chemistry by William L. Jolly

24. Concise coordination chemistry by Gopalan and Ramalingam

25. Satyaprakash's modern inorganic chemistry by R.D. Madan

Organic Chemistry :

1. Organic Chemistry By R T Morrison and R.N. Boyd

2. Organic Chemistry by T.J. Solomons

3. Organic Chemistry by L.G. Wade Sr

4. Organic Chemistry by D. Cram, G.S. Hammond and Herdricks

5. Modern Organic Chemistry by J.D. Roberts and M.C. Caserio

6. Textbook of Organic Chemistry by Ferguson

7. Problems and their solutions in organic Chemistry by I.L. Finar

8. Reaction mechanisms in Organic Chemistry by S.M. Mukherji and S.P. Singh

9. A guide book to mechanisms in Organic Chemistry by Peter Sykes

10. Organic spectroscopy by J.R. Dyer

11. Organic Spectroscopy by William Kemp

12. Fundamentals of organic synthesis and retrosynthetic analysis by Ratna Kumar kar

13. Comprehensive practical organic qualitative analysis by V.K. Ahluwalia & Sumta Dhingra

14. Comprehensive practical organic chemistry: Preparation and quantitive analysis by V.K. Ahluwalia and Reena Agarwal.

15. Organic Chemistry by Janice Gorzynski

16. Organic Chemistry by Stanley H Pine

17. Fundamentals of Organic Chemistry by John Mc Murray, Eric Simanek

18. Organic Chemistry by Francis A Carey

19. Text book of Organic Chemistry by K.S. Mukherjee

20. Organic Chemistry by Bhupinder Mehta & Manju Mehta

21. Organic Chemistry by L.G. Wade Jr, Maya Shankar Singh

22. Elementary organic spectroscopy by Y.R. Sharma

23. Chemistry & Industry by Gurdeep R. Chatwal

24. Applied Chemistry by Jayashree Ghosh

25. Drugs by David Krupadanam

26. Pharmacodynamics by R.C. Srivastava, Subit Ghosh

27. Analytical Chemistry by David Krupadanam

28. Green Chemistry - V.K. Ahluwalia

29. Organic Synthesis by V.K. Ahluwalia and R. Agarwal

30. New trends in Green Chemistry - by V.K. Ahulwalia & M. Kidwai

31. Industrial Chemistry by B.K. Sharma

32. Industrial Chemistry by Banerji

33. Industrial Chemistry by M.G. Arora

34. Industrial Chemistry by O.P. Veramani & A.K. Narula

35. Synthetic Drugs by O.D. Tyagi & M. Yadav

36. Medicinal Chemistry by Ashutoshkar

37. Medicinal Chemistry by P. Parimoo

38. Phaarmcology & Pharmacotherapeutics by R.S. Satoshkar & S.D. Bhandenkar

39. Medicinal Chemistry by Kadametal P-I & P-II

40. European Pharmacopoeia

41. Vogel's Qualitative organic analysis.

42. Laboratory manual of Organic Chemistry by Raj K Bansal

Physical Chemistry Books :

1. Physical chemistry A molecular approach by Donald A. Mcquarrie and John. D. Simon

2. Physical chemistry by G M Barrow

3. Principles of physical chemistry by Prutton and Marron

4. Physical chemistry by Peter Atkins, Julio D. Paula

5. Physical Chemistry by Ira N Levine

6. Elements of Physical Chemistry by Peter Atkins, Julio D. Paula

7. Text Book of Physical Chemistry by P.L. Soni, O.P. Dharmarha and Q.N. Dash

8. Solid State Chemistry and its applications by Anthony R.West

9.   Text book of physical chemistry by k L Kapoor

10. Thermodynamics for Chemists by S Glasston

11. Chemical Kinetics by K J Laidler

12. An Introduction to Electrochemisty by S. Glasston

13. Physical Chemistry through problems by S.K. Dogra

14. Thermodynamics by J. Jayaram and J.C. Kuriakose

15. Introductory Quantum Chemistry by A.K. Chandra

16. Physical Chemistry by J.W. Moore

17. Kinetics and mechanism by J.W. Moore and R.G. Pearson

18. Fundamentals of photochemistry by K.K. Rohtagi Mukharjee

19. Chemical thermodynamics by R.P. Rastogi and S.S. Misra

20. Advanced physical chemistry by Gurudeep Raj

21. Physical chemistry by G.W. castellan

22. Physical chemistry by Silbey, Alberty and Bawendi.

23. Elements of physical chemistry by S. Glasstone

24. Text book of physical chemistry by S. Glasstone

25. Fundamentals of Molecular spectroscopy by C.N. Banwell and E.M. McCash

26. Nanochemistry by Geoffrey Ozin and Andre Arsenault

27. Catalysis : Concepts and green applications by Gadi Rotherberg

28. Green Chemistry: Theory and practice by P.T. Anastas and J.C. Warner

29. Polymer Science by Gowriker, Viswanathan and Jayadev Sridhar

30. Introduction Polymer Chemistry by G.S. Misra

31. Polymer Chemistry by Bilmayer

32. Kinetics and Mechanism of Chemical Transformations by Rajaram and Kuriacose.

33. Senior practical physical chemistry by Khosla

B.Sc.
PHYSICS

FIRST YEAR

PAPER - I : Mechanics, Waves and Oscillations

SECOND YEAR

PAPER - II : Thermodynamics and Optics

FINAL YEAR

PAPER - III : Electricity, Magnetism and Electronics

PAPER - IV : Modern Physics

B.Sc. PHYSICS

FIRST YEAR

THEORY PAPER – I
MECHANICS, WAVES AND OSCILLATIONS

UNIT -I

1. Vector Analysis

Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field and related problems. Vector integration, line, surface and volume integrals. Stokes, Gauss and Green's theorems- simple applications.

2. Mechanics of Particles

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section, Rutherford scattering

3. Mechanics of rigid bodies

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Euler's equation, precession of a top, Gyroscope, precession of the equinoxes

UNIT - II

4. Mechanics of continuous media

Elastic constants of isotropic solids and their relation, Poisson's ratio and expression for Poisson's ratio in terms of y, n, k. Classification of beams, types of bending, point load, distributed load, shearing force and bending moment, sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with an end load

5. Central forces

Central forces - definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

6. Special theory of relativity (10)

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation. Concept of four vector formalism.

UNIT - III

7. Fundamentals of vibrations (12)

Simple harmonic oscillator, and solution of the differential equation- Physical characteristics of SHM, compound pendulum, measurement of 'g', torsion pendulum, - measurements of rigidity modulus. Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures

8. Damped and forced oscillations (12)

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance

9. Complex vibrations (6)

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw-tooth wave

UNIT - IV

10. Vibrations of bars (12)

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

11. Vibrating Strings (12)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance

12. **Ultrasonics (6)**

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Velocity of ultrasonics in liquids by Sear's method. Applications of ultrasonic waves.

Note: Problems should be solved at the end of every chapter of all units.

Text books

1. Berkeley Physics Course. Vol.1, Mechanics by C. Kittel, W. Knight, M.A. Ruderman -Tata-McGraw hill Company Edition 2008.

2. Fundamentals of Physics. Halliday, Resnick and Walker Wiley India Edition 2007.

3. Waves and Oscillations. S. Badami, V. Balasubramanian and K. Rama Reddy Orient Longman.

4. First Year Physics - Telugu Academy.

5. Mechanics of Particles, Waves and Oscillations. Anwar Kamal, New Age International.

6. College Physics-I. T. Bhimasankaram and G. Prasad. Himalaya Publishing House.

7. Introduction to Physics for Scientists and Engineers. F.J. Ruche. McGraw Hill.

8. Waves and Oscillations. N. Subramaniyam and Brijlal Vikas Publishing House Private Limited

Reference Books:

1. Fundamentals of Physics by Alan Giambattista et al Tata-McGraw Hill Company Edition, 2008.

2. University Physics by Young and Freeman, Pearson Education, Edition 2005.

3. Sears and Zemansky's University Physics by Hugh D. Young, Roger A. Freedman Pearson Education Eleventh Edition.

4. An introduction to Mechanics by Daniel Kleppner & Robert Kolenkow. The McGraw Hill Companies.

5. Mechanics. Hans & Puri. TMH Publications.

6. Engineering Physics. R.K. Gaur & S.L. Gupta. Dhanpat Rai Publications.

Practical Paper -I
FIRST YEAR PRACTICALS

1. Study of a compound pendulum determination of 'g' and 'k'.

2. Study of damping of an oscillating disc in Air and Water logarithmic decrement.

3. Study of Oscillations under Bifilar suspension.

4. Study of oscillations of a mass under different combination of springs.

5. 'Y' by uniform Bending (or) Non-uniform Bending.

6. Verification of Laws of a stretched string (Three Laws) - Sonometer

7. Moment of Inertia of a fly wheel.

8. Measurement of errors - Simple Pendulum.

9. Determination of frequency of a Bar - Melde's experiment.

10. 'n' by torsion pendulum.

11. Observation of Lissajous figures from CRO.

12. Study of flow of liquids through capillaries.

13. Determination of Surface Tension of a liquid by different methods.

14. Study of Viscosity of a fluid by different methods.

15. Volume Resonator -determination of frequency of a tuning fork.

Note: Any twelve of the experiments are to be performed.

SECOND YEAR

Theory Paper-II
THERMODYNAMICS AND OPTICS

UNIT - I

1. Kinetic theory of gases:

Introduction - Deduction of Maxwell's law of distribution of molecular speeds, Experimental verification Toothed Wheel Experiment, Transport Phenomena -Viscosity of gases - thermal conductivity - diffusion of gases.

2. Thermodynamics:

Introduction - Reversible and irreversible processes - Carnot's engine and its efficiency - Carnot's theorem - Second law of thermodynamics, Kelvin's and Claussius' statements - Thermodynamic scale of temperature - Entropy, physical significance - Change in entropy in reversible and irreversible processes - Entropy and disorder - Entropy of universe - Temperature- Entropy (T-S) diagram - Change of entropy of a perfect gas-change of entropy when ice changes into steam.

3. Thermodynamic potentials and Maxwell's equations:

Thermodynamic potentials - Derivation of Maxwell's thermodynamic relations -Clausius-Clayperon's equation - Derivation for ratio of specific heats - Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect - expression for Joule-Kelvin coefficient for perfect and Vanderwals gas.

UNIT - II

4. Low temperature Physics:

Introduction - Joule-Kelvin effect - liquefaction of gas using porous plug experiment. Joule expansion - Distinction between Joule- adiabatic and Joule- Thomson expansions - Expression for Joule- Thomson cooling - Liquefaction of helium, Kapitza's method - Adiabatic demagnetization - Production of low temperatures - Principle of refrigeration, vapour compression type. Working of refrigerator and air conditioning machines. Effects of Chloro and Fluro Carbons on Ozone layer; applications of substances at low-temperature.

5. Quantum theory of radiation: (10)

Black body-Ferry's black body - distribution of energy in the spectrum of Black body - Wein's displacement law, Wein's law, Rayleigh-Jean's law - Quantum theory of radiation - Planck's law - deduction of Wein's law, Rayleigh-Jeans law, from Planck's law - Measurement of radiation - Types of pyrometers - Disappearing filament optical pyrometer - experimental determination - Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

6. Statistical Mechanics:

Introduction to statistical mechanics, concept of ensembles, Phase space, Maxwell- Boltzmann's distribution law, Molecular energies in an ideal gas, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws. Black body radiation, Rayleigh - Jean's formula, Plank's radiation Law, weins displacement, Stefan's Boltzmann's Law from Plank's formula. Application of Fermi-Dirac statistics to white dwarfs and Neutron stars.

UNIT - III

7. Interference:

Principle of superposition - coherence - temporal coherence and spatial coherence -conditions for Interference of light

Interference by division of wave front: Fresnel's biprism - determination of wavelength of light. Determination of thickness of a thin transparent material using Biprism - change of phase on reflection - Lloyd's mirror experiment:

Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) - Colours of thin films - Non reflecting films - interference by a plane parallel film illuminated by a point source -Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire-Newton's rings in reflected light with and with out contact between Lens and glass plate, Newton's rings in transmitted light (Haidinger fringes). Determination of wavelength of monochromatic light -Michelson Interferometer - types of fringes - Determination of wavelength of monochromatic

light, Difference in wave length of sodium DI, D2 lines and thickness of a thin transparent plate.

8. **Diffraction:**

Introduction - Distinction between Fresnel and Fraunhoffer diffraction Fraunhoffer diffraction:- Diffraction due to single slit and circular aperture - Limit of resolution -Fraunhoffer diffraction due to double slit - Fraunhoffer diffraction pattern with N slits (diffraction grating)

Resolving Power of grating - Determination of wavelength of light in normal and oblique incidence methods using diffraction grating.

FresneI diffraction:-

Fresnel's half period zones - area of the half period zones -zone plate - Comparison of zone plate with convex lens - phase reversal zone plate- diffraction at a straight edge - difference between interference and diffraction.

UNIT - IV

9. **Polarization (10)**

Polarized light : Methods of Polarization, Polarizatioin by reflection, refraction, Double refraction, selective absorption , scattering of light - Brewster's law - Malus law - Nicol prism - polarizer and analyzer - Quarter wave plate, Half wave plate -Babinet's compensator - Optical activity, analysis of light by Laurent's half shade polarimeter.

10. **Laser, Fiber Optics and Holography:** (10)

Lasers: Introduction - Spontaneous emission - Stimulated emission - Population inversion . Laser principle - Einstein coefficients - Types of Lasers - He-Ne laser -Ruby laser - Applications of lasers.

Fiber Optics : Introduction - Optical fibers - Types of optical fibers - Step and graded index fibers - Rays and modes in an optical fiber - Fiber material - Principles of fiber communication (qualitative treatment only) and advantages of fiber communication.

Holography: Basic Principle of Holography - Gabor hologram and its limitations, Holography applications.

11.   The Matrix method in paraxial optics: (8)

Introduction, the matrix method, effect of translation, effect of refraction, system matrix, imaging by a spherical refracting surface. Imaging by a co-axial optical system. Unit planes. Nodal planes. A system of two thin lenses.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1.   Optics by Ajoy Ghatak. *The McGraw-Hill companies.*
2.   Optics by Subramaniyam and Brijlal. *S. Chand & Co.*
3.   Fundamentals of Physics. Halliday/Resnick/Walker.C. *Wiley India Edition 2007.*
4.   Optics and Spectroscopy. R. Murugeshan and Kiruthiga Siva Prasath. *S. Chand & Co.*
5.   Second Year Physics - *Telugu Academy.*
6.   Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) *S. Chand & Co.*

Reference Books

1.   Modern Physics by G. Aruldhas and P. Rajagopal, *Eastern Economy Education.*
2.   Berkeley Physics Course. Volume-5. Statistical Physics by F. Reif. *The McGraw-Hill Companies.*
3.   An Introduction to Thermal Physics by Daniel V. *Schroeder.Pearson Education Low Price Edition.*
4.   Thermodynamics by R.C. Srivastava, Subit K. Saha & Abhay K. *Jain Eastern Economy Edition.*
5.   Modern Engineering Physics by A.S. Vasudeva. *S.Chand & Co. Publications.*
6.   Feyman's Lectures on Physics Vol. 1,2,3 & 4. *Narosa Publications.*
7.   Fundamentals of Optics by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*

Practical Paper - II
SECOND YEAR PRACTICALS

1. Co-efficient of thermal conductivity of a bad conductor by Lee's method.

2. Measurement of Stefan's constant.

3. Heating efficiency of electrical kettle with varying voltages.

4. Determination of diameter of Lycopodium particles.

5. Thickness of a wire-wedge method.

6. Determination of wavelength of light-Biprism.

7. Determination of Radius of curvature of a given convex lens-Newton's rings.

8. Resolving power of grating.

9. Study of optical rotation-polarimeter.

10. Dispersive power of a prism

11. Determination of wavelength of light using diffraction grating-minimum deviation method.

12. Wavelength of light using diffraction grating - normal incidence method.

13. Resolving power of a telescope.

14. Refractive index of a liquid and glass (Boy's Method).

15. Pulfrich refractometer- determination of refractive index of liquid.

16. Wavelength of Laser light using diffraction grating.

Note: Any twelve of the above experiments to be performed.

FINAL YEAR

Theory Paper-III
ELECTRICITY, MAGNETISM AND ELECTRONICS

UNIT - I

1. Electrostatics

Gauss' law and its applications-Uniformly charged sphere, charged cylindrical conductor and an infinite conducting sheet of charge. Deduction of Coulmb's law from Gauss law, Mechanical force on a charged conductor Electric potential -Potential due to a charged spherical conductor, electric field strength from the electric dipole and an infinite line of charge. Potential of a uniformly charged circular disc.

2. Dielectrics

An atomic view of dielectrics, potential energy of a dipole in an electric field. Polarization and charge density, Gauss's law for dielectric medium- Relation between D,E, and P. Dielectric constant, susceptibility and relation between them. Boundary conditions at the dielectric surface. Electric fields in cavities of a dielectric- needle shaped cavity and disc shaped cavity.

3. Capacitance

Capacitance of concentric spheres and cylindrical condenser, capacitance of parallel plate condenser with and without dielectric. Electric energy stored in a charged condenser- force between plates of condenser, construction and working of attracted disc electrometer, measurement of dielectric constant and potential difference.

UNIT - II

1. Moving charge in electric and magnetic field

Hall effect, cyclotron, synchrocyclotron and synchrotron - force on a current carrying conductor placed in a magnetic field, force and torque on a current loop, Biot -Savart's law and calculation of B due to long straight wire, a circular current loop and solenoid.

2. Electromagnetic induction

Faraday's law -Lenz's law - expression for induced emf - time varying magnetic fields - Betatron -Ballistic galvanometer - theory - damping

correction - self and mutual inductance, coefficient of coupling, calculation of self inductance of a long solenoid - toroid - energy stored in magnetic field - transformer - Construction, working, energy losses and efficiency.

UNIT - III

1. Varying and alternating currents

Growth and decay of currents in LR, CR and LCR circuits - Critical damping. Alternating current, relation between current and voltage in pure R,C and L-vector diagrams - Power in ac circuits. LCR series and parallel resonant circuit - Q-factor. AC & DC motors-single phase, three phase (basics only).

2. Maxwell's equations and electromagnetic waves

A review of basic laws of electricity and magnetism - displacement current -Maxwell's equations in differential form - Maxwell's wave equation, plane electromagnetic waves - Transverse nature of electromagnetic waves, Poynting theorem, production of electromagnetic waves (Hertz experiment)

UNIT - IV

1. Basic Electronics

Formation of electron energy bands in solids, classification of solids in terms of forbidden energy gap. Intrinsic and extrinsic semiconductors, Fermi level, continuity equation - p-n junction diode, Zener diode characteristics and its application as voltage regulator. Half wave and full wave rectifiers and filters, ripple factor (quantitative) - p n p and n p n transistors, current components in transistors, CB,CE and CC configurations - transistor hybrid parameters - determination of hybrid parameters from transistor characteristics - transistor as an amplifier — RC coupled amplifier (qualitative) concept of negative feed back and positive feed back -Barkhausen criterion, and phase shift oscillator (qualitative).

2. Digital Principles

Binary number system, converting Binary to Decimal and vice versa. Binary addition and subtraction (1's and 2's complement methods). Hexadecimal number system. Conversion from Binary to Hexadecimal - vice versa and Decimal to Hexadecimal vice versa.

Logic gates: OR,AND,NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates,

Exclusive - OR gate, De Morgan's Laws - statement and proof, Half and Full adders. Parallel adder circuits.

NOTE: Problems should be solved from every chapter of all units.

Textbooks

1. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath - *S. Chand & Co.* for semi conductor *&* Digital Principles)

2. Fundamentals of Physics- Halliday/Resnick/Walker - *Wiley India Edition 2007.*

3. Berkeley Physics Course - Vol. II - Electricity and Magnetism - Edward M Purcell -*The McGraw-Hill Companies.*

4. Electricity and Magnetism - D.N. Vasudeva. *S. Chand & Co.*

5. Electronic devices and circuits - Millman and Halkias. *Mc.Graw-Hitt Education.*

6. Electricity and Magnetism Brijlal and Subramanyam. *Ratan Prakashan Mandir.*

7. Digital Principles and Applications by A.P. Malvino and D.P. Leach. *McGraw Hill Education.*

Reference Books

1. Electricity and Electronics - D.C. Tayal. *Himalaya Publishing House.*

2. Electricity and Magnetism -C.J. Smith. *Edward Arnold Ltd.*

3. Electricity, Magnetism with Electronics - K K Tewari. *R.Chand & Co.*

4. Third year Physics - *Telugu Akademy*

5. Principles of Electronics by V.K. Mehta - *S. Chand & Co.*

MODERN PHYSICS

UNIT - 1 : SPECTROSCOPY

1. Atomic Spectra (13 periods)

Introduction - Drawbacks of Bohr's atomic model - Sommerfeld's elliptical orbits -relativistic correction (no derivation). Stern & Gerlach experiment, Vector atom model and quantum numbers associated with it. L-S and j-j coupling schemes. Spectral terms, selection rules, intensity rules - spectra of alkali atoms, doublet fine structure, alkaline earth spectra, singlet and triplet fine structure. Zeeman Effect, Paschen-Back Effect and Stark Effect (basic idea).

2. Molecular Spectroscopy: (12 periods)

Types of molecular spectra, pure rotational energies and spectrum of diatomic molecule. Determination of inter nuclear distance Vibrational energies and spectrum of diatomic molecule. Raman effect, classical theory of Raman effect. Experimental arrangement for Raman effect and its applications.

UNIT - II:

Quantum Mechanics

3. Inadequacy of classical Physics: (5 periods)

Spectral radiation - Planck's law (only discussion). Photoelectric effect - Einstien's photoelectric equation. Compton's effect - experimental verification. Limitations of old quantum theory.

4. Matter Waves(10 periods):

de Broglie's hypothesis - wavelength of matter waves, properties of matter waves. Phase and group velocities. Davisson and Germer experiment. Davisson and Germer experiment. Double slit experiment. Standing de Brogile waves of electron in Bohr orbits.Heisenberg's uncertainty principle for position and momentum (x and p_x), Energy and time (E and t). Gamma ray microscope. Diffraction by a single slit. Position of electron in a Bohr orbit. Complementary principle of Bohr.

5. Schrodinger Wave Equation (10 periods):

Schrodinger time independent and time dependent wave equations. Wave function properties - Significance. Basic postulates of quantum mechanics. Operators, eigen functions and eigen values, expectation values. Application of Schrodinger wave equation to particle in one and three dimensional boxes, potential step and potential barrier.

Unit - III

Nuclear Physics

6. **Nuclear Structure** (5 **periods):** Basic properties of nucleus - size, charge, mass, spin, magnetic dipole moment and electric quadrupole moment. Binding energy of nucleus, deuteron binding energy, p-p, n-n, and n-p scattering (concepts), nuclear forces. Nuclear models- liquid drop model, shell model.

7. **Alpha and Beta Decays** (5 **periods):** Range of alpha particles, Geiger - Nuttal law. Gammow's theory of alpha decay. Geiger - Nuttal law from Gammow's theory. Beta spectrum - neutrino hypothesis, Fermi's theory of -decay (qualitative).

8. **Nuclear Reactions and Nuclear Detectors (5 periods) :** Types of nuclear reactions, nuclear reaction kinematics. Compound nucleus, direct reactions, channels (concepts).

    GM counter, proportional counter, scintillation counter, Wilson cloud chamber and solid state detector

Unit-IV

Solid State Physics Crystolography

9. **Crystal Structure** : Crystalline nature of matter.   Cystal lattice, Unit Cell, Elements of symmetry.   Crystal systems, Bravais lattices. Miller indices.   Simple crystal structures (S.C., BCC, FCC, CsCl, NaCl, diamond and Zinc Blende)

    X-ray Diffraction: Diffraction of X -rays by crystals, Bragg's law, Experimental techniques - Laue's method and powder method.

10. **Bonding in Crystals (5 periods):** Types of bonding in crystals - characteristics of crystals with different bondings. Lattice energy of ionic crystals - determination of Madelung constant for NaCl crystal. Calculation of Born Coefficient and repulsive exponent. Born-Haber cycle.

11. **Superconductivity: (6 periods)**

    Basic experimental facts - zero resistance, effect of magnetic field, Meissner effect, persistent current, Isotope effect, Thermodynamic properties, specific heat, entropy. Type I and Type II superconductors. High temperature superconductors (discussion only)

12. **Nanomaterials (4 periods)** : Introduction, nanoparticles, metal nanoclusters, semiconductor nanoparticles, carbon clusters, carbon nanotubes, quantum nanostructures - nanodot, nanowire and quantum well. Fabrication of quantum nanostructures.

NOTE: Problems should be solved from every chapter of all units.

Textbooks

1. Modern Physics by G. Aruldhas & P. Rajagopal.
   Eastern Economy Edition.

2. Concepts of Modern Physics by Arthur Beiser.
   Tata McGraw-Hill Edition.

3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath.
   S. Chand & Co.

4. Nuclear Physics by D.C. Tayal, *Himalaya Publishing House.*

5. Molecular Structure and Spectroscopy by G. Aruldhas.
   Prentice Hall of India, New Delhi.

6. Spectroscopy -Atomic and Molecular by Gurdeep R Chatwal and Shyam Anand -*Himalaya Publishing House.*

7. Third Year Physics - *Telugu Academy.*

8. Elements of Solid State Physics by J.P. Srivastava. (for chapter on nanomaterials)-*Prentice-hall of India Pvt. Ltd.*

Reference Books

1. University Physics with Modern Physics by Young & Freedman.
   A. Lewis Ford. Low Price Edition (Eleventh Edition).

2. Quantum Physics by Eyvind H. Wichman. Volume.4.
   The McGraw-Hill Companies.

3. Quantum Mechanics by Mahesh C. Jani. *Eastern Economy Edition.*

4. Nuclear Physics Irving Kaplan - *Narosa Publishing House.*

5. Introduction to Solid State Physics by Charles Kittel.
   John Wiley and Sons.

6. Solid State Physics by A.J. Dekker. *Mac Millan India*

Practical Paper - III
THIRD YEAR PRACTICALS

1. Carey-Foster's Bridge - comparison of resistances.

2. Internal resistance of a cell by potentiometer.

3. Figure of merit of a moving coil galvanometer.

4. Voltage sensitivity of a moving coil galvanometer.

5. RC circuit - time constant

6. LR circuit - time constant

7. RC circuit (Frequency response)

8. LR circuit (Frequency response)

9. LCR circuit series/parallel resonance, Q-factor

10. Determination of M and H

11. Power factor of an A.C. Circuit

12. Determination of ac-frequency-sonometer.

13. Design and construction of multimeter.

14. Construction of a model D.C. power supply.

15. Verification of Kirchoff s laws. Note: Any twelve of the above experiments to be performed.

Practical Paper - IV
THIRD YEAR PRACTICALS

1. e/m of an electron by Thomson method.

2. Characteristics of a junction diode

3. Characteristics of a zener diode

4. Characteristics of Transistor

5. Energy gap of semiconductor using a junction diode

6. Temperature-resistance characteristics of thermistor

7. R.C. coupled amplifier

8. Verification of Logic gates AND, OR, NOT, X-OR gates

9. Verification of De Morgan's theorems.

10. Construction and verification of truth tables for half and full adders.

11. Phase shift Oscillator

12. Hysteresis curve of transformer core

13. Determination of Planck's constant (photocell)

14. Study of hydrogen spectrum (Rydberg constant)

15. Study of absorption of a and P rays

Note: Any twelve of the above experiments to be performed.

Not for examination:

Servicing of domestic appliances - Electric Iron, immersion heater, fan, hot plate grinder, emergency lamp, battery charger, micro-oven, loud speaker, eliminator, cell-phones, servicing of refrigerator.

Suggested Books for Practicais

1. A textbook of Practical Physics by M.N. Srinivasan. *S. Chand& Co.*

2. Practical Physics by M. Arul Thakpathi by *Comptek Publishers.*

3. A. Laboratory manual for Physics Course by B.P. Khandelwal.

4. B.Sc. Practical Physics - C.L. Arora - *S. Chand & Co.*

5. Viva-voce in Advanced Physics - R.C. Gupta and Saxena P.N. - *Pragathi Prakashan, Meerut.*

6. Viva-Voce in Physics - R.C. Gupta, *Pragathi Prakashan, Meerut.*

B.Sc.
ELECTRONICS

FIRST YEAR

PAPER - I **:** Circuit Analysis and Electronic Devices

SECOND YEAR

PAPER - II **:** Analog Circuits and Communications

THIRD YEAR

PAPER - III : Digital Electronics and Microprocessor

PAPER - IV : Embedded Systems and Applications

B.Sc ELECTRONICS
FIRST YEAR

Paper - I
CIRCUIT ANALYSIS AND
ELECTRONIC DEVICES

UNIT - I

AC Fundamentals : The sine wave - average and rms values - The j operator - polar and rectangular forms of complex numbers- phasor diagram - complex impedance and admittance.

Passive networks: Concept of voltage and current sources - KVL and KCL Application to simple circuits (ac and dc) consisting of resistors and sources (one or two) - Node voltage analysis and method of mesh currents.

Network theorems (dc and ac): Superposition theorem - Thevenin's theorem -Norton's Theorem-maximum power transfer theorem-Millmans Theorem-reciprocity theorem-Application to simple networks.

UNIT - II

RC and RL Circuits: Transient response of RL and RC circuits with step input-time contants. Frequency response of RC and RL circuits-Types of Filters: Low pass filter-High pass filter-frequency response-Passive differentiating and integrating circuits.

Response: Series resonance and parallel resonance LCR circuits-resonant frequency-Q factor band width-selectivity.

UNIT - III

PN Junction: Depletion region -Junction capacitance-Diode equation (no derivation)- Effect of temperature on reverse saturation current. Construction, working, V-I characteristics and simple application of (i) Junction diode (ii) Zener diode (iii) Tunnel diode and (iv) Varactor diode.

Bipolar Junction Transistor (BJT): PNP and NPN transistors-current components in BJT-BJT static characteristics (Input and Output)- Early effect - CB, CC, CE configurations(cut off, active,

and saturation regions). CE configuration as two port network- h-parameters h-parameter equivalent circuit. Experimental arrangement to study input and output characteristics of BJT in CE configuration. Determination of h-parameters from the characteristics. Biasing and load line analysis-Fixed bias and self bias arrangement.

UNIT-IV

Field Effect Transistor (FET): Structure and working of JFET and MOSFET -output and transfer characteristics- Experimental arrangement for studying the characteristics and to determine FET parameters. Application of FET as voltage variable resistor and MOSFET as a switch-Advantages of FET over transistor.

Uni Junction Transistor (UJT): Structure and working of UJT-Characteristics, Application of UJT as a relaxation oscillator.

Silicon Controlled Rectifier (SCR): Structure and working of SCR, Two transistor representation, Characteristics of SCR, Experimental set up to study the SCR characteristics. Application of SCR for power control.

Photo Electric Devices: Structure and operation of LDR, Photo voltaic cell, Photo diode, Photo transistor and LED.

(NOTE: Solving related problems in all the Units)

Reference Books:

1. Grob's Basic Electronics-Mitchel E.Schultz 10th Edn. Tata McGraw Hill (TMH)
2. Network lines and fields-Ryder-Prentice Hall of India (PHI)
3. Circuit analysis- P.Gnanasivam-Pearson Education
4. Circuits and Networks- A.Sudhakar & Shyammohan S.Palli-TMH
5. Network Theory-Smarajit Ghosh-PHI
6. Electronic Devices and Circuits-Millman and Halkias-TMH
7. Electronic Devices and circuits-Alien Mottershead-PHI
8. Principles of Electronics -V.K.Mehta and Rohit Mehta-S Chand &co
9. Electronic Devices and Circuit Theory-R.L.Boylestad and L.Nashelsky-Pearson Eduction.
10. Pulse digital switching waveforms-Millman & Taub -TMH

11. Applied Electronics-R.S.Sedha - S Chand & Co
12. A First course in Electronics-AA Khan & KK Day -PHI
13. Principles of Electronic circuits-Stanely G.Burns and Paul R.Bond-Galgotia
14. Electronic Principles and Application -A.B. Bhattacharya-New Central Book Agency Pvt.

PRACTICALS PAPER

CIRCUIT ANALYSIS AND ELECTRONIC DEVICES LAB

1. Measurement of peak voltage, frequency and phase using CRO.

2. Thevenin's theorem - verification

3. Norton's theorem-verification.

4. Maximum power transfer theorem - verification.

5. CR and LR circuits Frequency response- (Low pass and High pass)

6. CR and LR circuits Differentiation and integration - tracing of waveforms

7. LCR-Series resonance circuit-Frequency response-Determination of f_0, Q and band width.

8. To draw volt-ampere characteristics of Junction diode and determine the cut-in voltage, forward and reverse resistance.

9. Zener diode V-I Characteristics-Determination of Zener breakdown voltage

10. Voltage regulator using Zener diode

11. BJT input and output characteristics (CE configuration) and determination of 'h' parameters

12. FET- characteristics and determination of FET parameters.

13. UJT

14. (i) V-I Characteristics (ii) Relaxation Oscillator

15. (LDR-characteristics

16. SCR Volt-ampere characteristics.

Note: Student has to perform any 12 experiments

SECOND YEAR

PAPER -II
ANALOG CIRCUITS AND COMMUNICATIONS

UNIT - I

Power Supplies: Rectifiers-Halfwave, fullwave and bridge rectifiers- Efficiency-Ripple factor - Regulation - Harmonic components in rectified output - Types of filters - Choke input (inductor) filter-Shunt capacitor filter-L section and ð section filters - Block diagram of regulated power supply - Series and shunt regulated power supplies -Three terminal regulators (78 XX and 79 XX)-Principle and working of switch mode power supply (SMPS).

UNIT - II

RC Coupled Amplifier: Analysis and frequency response of single stage RC coupled CE amplifier.

Feedback: Positive and negative feedback- Effect of feedback on gain, band width, noise, input and output impedances.

Operational Amplifiers: Differential amplifier- Block diagram of Op-Amp- Ideal characteristics of Op-Amp- Op-Amp parameters-Input resistance Output resistance Common mode rejection ratio (CMMR)-Slew rate Offset voltages- Input bias current-Basic Op-Amp circuits-Inverting Op-Amp Virtual ground- Non-inverting Op-Amp Frequency response of Op-Amp. Interpretation of Op-Amp data sheets.

UNIT - III

Applications of Op-Amps: Summing amplifier- subtractor-Voltage follower-Integrator Differentiator-Comparator-Logarithmic amplifier-Sine wave [Wein Bridge] and square wave {Astable} generators- Triangular wave generator-Monostable multivibrator-Solving simple second order differential equation. Basic Op-Amp series regulator and shunt regulator.

Unit - IV

Communications: Need for modulation-Types of modulation-Amplitude, Frequency and Phase modulation.

Amplitude modulation-side bands-modulation index-square law diode modulator-Demodulation-diode detector.

Frequency modulation working of simple frequency modulator-Ratio detection of FM waves-

Advantages of frequency modulation.

AM and FM radio receivers [block diagram approach].

NOTE: (Solving related problems in all the Units)

Reference Books:

1. Electronic Devices and Circuits-Millman and Halkias-Tata Me Graw Hill (TMH)
2. Microelectronic- J.Milman and A.Grabel-TMH
3. Operational Amplifiers and Linear Integrated Circuits-Ramakant A. Gayakwad-Prentice Hall of India (PHI).
4. Operational Amplifiers and Linear Integrated Circuits-K. Lalkishore - Pearson Education
5. Analog Electronic-L.K.Maheswari and M.M.S.Anand-PHI
6. Applied Electronic-R.S.Sedha-S.Chand&Co
7. Principles of Electronics-V.K.Mehta and Rohit Mehta-S Chand&Co
8. A first Course in Electronics-A.A.Khan & K.K.Dey-PHI
9. Electronic Communication Systerms-George Kennedy & Bernard Davis-TMH.
10. Electronic Communication-D.Roddy & J.Coolen -PHI
11. Principles of Electronic Communication Systerms-Louis E.Frenzel-TMH.

THIRD YEAR

PAPER - III
DIGITAL ELECTRONICS AND MICROPROCESSOR

UNIT -1

Introduction to number systems, Logic gates OR, AND, NOT, X-OR, NAND, NOR gates-Truth tables-Positive and negative logic - Logic families and their characteristics-RTL, DTL, ECL, TTL and CMOS.- Universal bulding blocks NAND and NOR gates. Laws of Boolean algebra De Morgan's Theorems-Boolean identities - Simplification of Boolean expressions-Karnaugh Maps- Sum of products (SOP) and Product of sums (POS).

UNIT - II (22 HOURS)

Combinational and Sequential circuits: Multiplexer and De-Multiplexer-Decoder, Half adder, Full adder and Parallel adder circuits. Flip flops - RS, D, JK and JK Master-Slave (working and truth tables)- Semiconductor memories - Organization and working-Synchronous and asynchronous binary counters, Up/Down counters - Decade counter (7490) - working, truth tables and timing diagrams.

UNIT - III (23 HOURS)

Introduction to Microcomputer and Microprocessor: Intel 8085Microprocessor- central processing unit CPU - arithmetic and logic unit ALU-timing and control unit - register organization - address, data and control buses- pin configuration of 8085 and its description. Timing diagrams- instruction cycle, machine cycle, fetch and execute cycles.

Instruction set of 8085, instruction and data formats- classification of instructions- addressing modes. Assembly language programming examples of 8 and 16 bit addition, subtraction, multiplication and division. Finding the largest and smallest in a data array. Programming examples using stacks and subroutines.

UNIT - IV (22HOURS)

Interfacing peripherals and applications: Programmable peripheral interface (8255)-D/A and A/D converters and their

interfacing to the Microprocessor. Stepper motor control- seven segment LED.

(Note: Solving related problems in all the Units)

Reference Books:

1. Digital Principles and Applications- Malvino & Leach-TMH

2. Digital Fundamentals - F.Loyd & Jain -Pearson Education

3. Modern Digital Electronics -R.P. Jain-TMH

4. Fundamental of Digital Circuits- Anand Kuman -PHI

5. Digital Systems-Rajkamal-Pearson Education

6. Digital Electronic Principles and Integrated Circuits-Maini-Willey India.

7. Digital Electronics- Gothman-

8. Digital Electronics-J.W.Bignel & Robert Donova-Thomson Publishers (Indian 5th Ed)

9. Microprocessor Architecture and Programming - Ramesh S.Goanker - Penram

10. Introduction to Microprocessor-Aditya p. Mathur-TMH

11. Microprocessors and Microcontrollers Hardware and Interfacing-Mathivnnan-PHI

12. Fundamentals of Microprocessors and Microcontrollers-B.Ram-Dhanpat Rai & Sons.

13. Advanced Microprocessor and Peripherals, Architecture, Programming and Interface-A.K.Ray and K.N.Bhurchandi-TMH

14. Microprocessor Lab Premier-K.A. Krishna Murthy.

PRACTICALS

PAPER - III

DIGITAL ELECTRONICS AND MICROPROCESSOR LAB

A) Digital Experiments

1. Verifying truth of OR,AND,NOT,NAND,NOR and EX-OR gates (By using 7400 -series).

2. Constructing other gates using NAND and NOR gates

3. Construction of Half and Full adders and verify their truth tables.

4. Operation and verifying truth tables of flip-flops-RS,D, and JK using ICs.

5. Construction of Decade counters (7490).

6. Driving Stepper motor using JK flip-flop.

7. Simulation experiments using appropriate electronic circuit simulation.
    a) 4-bit parallel adder using combinational circuits.
    b) Decade counter using JK flip flops.
    c) Up/Down counter using JK flip flops.
    d) Up/Down counter using 7493.

B) Microprocessor (Software)

1. Binary addition & subtraction . (8-bit & 16- bit)

2. Multiplication & division.

3. Picking up largest/smallest number.

4. Arranging - ascending / descending order.

5. Decimal addition (DAA) & Subtraction.

6. Time delay generation.

C) Microprocessor (Hardware)

1. Interfacing R-2R Ladder network (DAC) (4 bits) to generate waveforms.

2. Interfacing a stepper motor and rotating it clockwise/anti clockwise through a known angle.

3. Interfacing a seven segment display.

4. Interfacing ADC for temperature measurement. **Note: Student has to perform the following experiments:**

    (i)   In Section (A) any four experiments among experiment numbers 1 to 6
    (ii) Experiment Number 7 (a,b,c and d) is compulsory
    (iii) All experiments in section (B)
    (iv) Any two experiments in section (C)

B.Sc. ELECTRONICS

THIRD YEAR

ELECTIVE PAPER - IV (A):
EMBEDDED SYSTEMS AND APPLICATIONS

UNIT -I

The 8051 Microcontroller

Introduction to microcontrollers and embedded systems: Overview and block diagram of 8051. Architecture of 8051. Program counter and memory organization. Data types and directives, Flag bits and PSW Register banks and Stack; Pin diagram, Port organization, I/O Programming, Bit manipulation. Interrupts and timer.

UNIT - II

Addressing modes, instruction set and assembly language programming of 8051

Addressing modes and accessing memory using various addressing modes. Instruction set: Arithmetic, Logical, Single Bit, Jump, Loop and Call Instructions and their usage. Time Delay Generation and Calculation; Timer/Counter Programming. Programming examples: Addition, multiplication, subtraction, division, arranging a given set of numbers in ascending / descending order, picking the smallest / largest number among a given set of numbers, Accessing a specified port terminal and generating a rectangular waveform.

UNIT - III

Interfacing of peripherals to Microcontroller

Interfacing of-PPI 8255, DAC. ADC. Serial communication- modes and protocols

UNIT - IV

Applications of Embedded Systems

Temperature measurement, displaying information on a LCD, Control of a Stepper Motor, Interfacing a keyboard and generation different types of waveforms.

Reference Books:

1. The 8051 Microcontrollers and Embedded Systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi-Pearson Education Asia, 4th Reprint, 2002.

2. Microcontrollers - Theory and applications by Ajay V.Deshmukh - Tata McGraw-Hill

3. The 8051 Microcontroller - architecture, programming & applications By Kenneth J. Ayala-Penram International Publishing, 1995

4. Programming and Customizing the 8051 Microcontroller - By Myke Predko-TMH, 2003

5. Design with Microcontrollers By - JB Peatman - TMH.

6. The 8051 Microcontroller - Programming, interfacing and applications by Howard Boyet and Ron Katz - (MII) Microcontrollers Training Inc.

7. The concepts & features of Microcontrollers by Rajkamal-Wheeler Pub.

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ELECTIVE PAPER - IV (A) :

PRACTICALS

EMBEDDED SYSTEMS AND APPLICATIONS LAB

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Microcontroller Experiments using 8051 kit

1. Multiplication of two numbers using MUL command (later using counter method for repeated addition)

1. Division of two numbers using DIV command (later using counter method for repeated subtraction)

2. Pick the smallest number among a given set of numbers

3. Pick the largest number among a given set of numbers

4. Arrange 'n' numbers in ascending order

5. Arrange 'n' numbers in descending order

6. Generate a specified time delay

7. Interface a ADC and a temperature sensor to measure temperature

8. Interface a DAC & Generate a stair case wave form-with step duration and no. of steps as variables

9. Flash a LED connected at a specified out put port terminal

10. Interface a stepper motor- and rotate it clock wise or anti clock wise through given angle steps.

11. Using Keil software write a program to pick the smallest among a given set of numbers

12. Using Keil software write a program to pick the largest among a given set of numbers

13. Using Keil software write a program to arrange a given set of numbers in ascending order

14. Using Keil software write a program to arrange a given set of numbers in descending order

15. Using Keil software write a program to generate a rectangular wave form at a specified port terminals

Note: Students has to perform the following experiments
(1) 8 Experiments among experiment numbers 1 to 11
(2) Experiment Numbers from 12 to 15 are compulsory

STUDENTS ARE ENCOURAGED TO DO
A SMALL PROJECT WORK DURING THIRD YEAR

B.Sc.
STATISTICS

FIRST YEAR

PAPER - I : Descriptive Statistics and
Probability Distributions

SECOND YEAR

PAPER - II : Statistical Methods and Inference

THIRD YEAR

PAPER - III : Applied Statistics

PAPER - IV : Elective
1. Quality, Reliability and
Operations Research

B.Sc. STATISTICS

FIRST YEAR

Paper -I :
DESCRIPTIVE STATISTICS AND PROBABILITY DISTRIBUTIONS

UNIT - I

Descriptive Statistics: Concept of primary and secondary data. Methods of collection and editing of primary data. Designing a questionnaire and a schedule. Sources and editing of secondary data. Classification and tabulation of data. Measures of central tendency (mean, median, mode, geometric mean and harmonic mean) with simple applications. Absolute and relative measures of dispersion (range, quartile deviation, mean deviation and standard deviation) with simple applications. Importance of moments, central and non-central moments, and their interrelationships, Sheppard's corrections for moments for grouped data. Measures of skewness based on quartiles and moments and kurtosis based on moments with real life examples.

Probability: Basic concepts in probability—deterministic and random experiments, trail, outcome, sample space, event, and operations of events, mutually exclusive and exhaustive events, and equally likely and favourable outcomes with examples. Mathematical, statistical and axiomatic definitions of probability with merits and demerits. Properties of probability based on axiomatic definition. Conditional probability and independence of events. Addition and multiplication theorems for n events. Boole's inequality and Bayes' theorem. Problems on probability using counting methods and theorems.

UNIT-II

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties. Transformation of one-dimensional random variable (simple 1-1 functions only). Notion of bivariate random variable, bivariate distribution and statement of its properties. Joint, marginal and conditional distributions. Independence of random variables.

Mathematical Expectation: Mathematical expectation of a function of a random variable. Raw and central moments and covariance using mathematical expectation with examples. Addition and multiplication theorems of expectation. Definition of moment generating function (m.g.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and characteristic function (c.f) and statements of their properties with applications. Chebyshev's, and Cauchy-Schwartz's inequalities and their applications. Statement and applications of weak law of large numbers and central limit theorem for identically and independently distributed (i.i.d) random variables with finite variance.

UNIT-III

Discrete distributions: Uniform, Bernoulli, Binomial, Poisson, Negative binomial, Geometric and Hyper-geometric(mean and variance only) distributions. Properties of these distributions such as m.g.f ,c.g.f, p.g.f., c.f., and moments up to fourth order and their real life applications. Reproductive property wherever exists. Binomial approximation to Hyper-geometric, Poisson approximation to Binomial and Negative binomial distributions.

UNIT-IV

Continuous distributions: Rectangular and Normal distributions. Normal distribution as a limiting case of Binomial and Poisson distributions. Exponential, Gamma, Beta of two kinds (mean and variance only) and Cauchy (definition and c.f. only) distributions. Properties of these distributions such as m.g.f, c.g.f., c.f, and moments up to fourth order, their real life applications and reproductive productive property wherever exists.

List of reference books:

1. Willam Feller : Introduction to Probability theory and its applications. Volume -I, Wiley

2. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi

3. GoonAM,Gupta MK,Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press   Pvt.Ltd., Kolakota.

4. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.

5. M.JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.

6. Sanjay Arora and Bansi Lah.New Mathematical Statistics : Satya Prakashan , New Delhi

7. Hogg.Tanis.Rao: Probability and Statistical Inference. 7th edition. Pearson

8. Sambhavyata Avadhi Siddantalu—Telugu Academy

9. Sahasambandham-Vibhajana Siddantamulu - Telugu Academy

10. K.V.S. Sarma: statistics Made Simple:do it yourself on PC.   PHI

11. Gerald Keller :Applied Statisticswith Microsoft excel . Duxbury, Thomson Learning.

12. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel 4th edition. Pearson Publication.

Practical Paper -I

1. Basics of Excel- data entry, editing and saving, establishing and copying a formulae, built in functions in excel, copy and paste and exporting to MS word document.

2. Graphical presentation of data (Histogram, frequency polygon, Ogives).

3. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS Excel

4. Diagrammatic presentation of data (Bar and Pie).

5. Diagrammatic presentation of data (Bar and Pie) using MS Excel

6. computation of non-central and central moments - Sheppard's corrections for grouped data.

7. Computation of coefficients of Skewness and Kurtosis - Karl Pearson's and Bowley's â, and â$_2$.

8. Computation of measures of central tendency, dispersion and coefficients of Skew -ness, Kurtosis using MS Excel.

9. Fitting of Binomial distribution - Direct method.

10. Fitting of Binomial distribution - Direct method using MS Excel.

11. Fitting of binomial distribution - Recurrence relation Method.

12. Fitting of Poisson distribution - Direct method.

13. Fitting of Poisson Distribution - Direct method using MS Excel.

14. Fitting of Poisson distribution - Recurrence relation Method.

15. Fitting of Negative Binomial distribution.

16. Fitting of Geometric distribution.

17. Fitting of Normal distribution - Areas method.

18. Fitting of Normal distribution - Ordinates method.

19. Fitting of Exponential distribution.

20. Fitting of Exponential distribution using MS Excel.

21. Fitting of a Cauchy distribution.

22. Fitting of a Cauchy distribution using MS Excel.

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

SECOND YEAR

Paper - II :
STATISTICAL METHODS AND INFERENCE

Unit-I

Population correlation coefficient and its properties. Bivariate date, scattered diagram, sample correlation coefficient, computation of correlation coefficient for grouped data. Correlation ratio, Spearman's rank correlation conefficient and its properties. Principle of lease squares, simple linear regression correlation verses regression, properties of regression coefficients. Fitting of quadratic and power curves. Concepts of partial and multiple correlation coefficients (Only for three variables). Analysis of categorical data, independence and association and partial association of attributes, various measures of association (Yule's) for two way data and coefficient of contingency (Pearson and Tcherprow), coefficient of colligation. (30 L)

Unit-II

Concepts of population, parameter, random sample, statistic, sampling distribution and standard error. Standard error of sample means(s) and sample proportion(s). Exact sampling distributions-Statement and properties of x^2, t and F distributions and their interrelationships. Independence of sample means and variance in random sampling from normal distributions.

Point estimation of a parameter, concept of bias and mean square error of an estimate. Criteria of good estimator - consistency, unbiasedness, efficiency and sufficiency with examples. Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions. Estimation by method of moments, Maximum likelihood (ML), statements of asymptotic properties of MLE. Concept of interval estimation. Confidence intervals of the parameters of normal population by Pivot method.

Unit-III

Concepts of statistical hypotheses, null and alternative hypothesis, critical regional two types of errors, level of significance and power

of a test. One and two tailed tests, test function (non-randomized and randomized). Neyman-Pearson's fundamental lemma for Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their powers. Use of central limit theorem in tests. Large sample tests and confidence intervals for means(s), proportion(s), standard deviation(s) and correlation coefficient(s).

Unit-IV

Tests of significance based on x^2, t and F. x^2-tests goodness of fit and test for independence of attributes. Definition of order statistics and statement of their distributions.

Non-parametric tests-their advantages and disadvantages, comparison with parametric tests. Measurement scale-nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon-Mann-Whitney U test, Wald Wolfowitz's runs test.

List of Reference Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Cahnd & Sons, New Delhi

2. Goon AM, Gupta MK, Das Gupta B: Outlines of Statistics, Vol-II, the World Press Pvt.Ltd.,Kolakota

3. Hoel P.G.: Introduction to matechematical statistics, Asia Publishing house.

4. Sanjay Arora and Bansi Lal: New mathematical Statistisc Satya Prakashan, New Delhi

5. Hogg and Craig: Introduction to Mathematical statistics. Prints Hall

6. Siegal,S.,and Sidney:Non-param etric statistics for Behavioral Science. McGraw Hill.

7. Gibbons J.D. and Subhabrata Chakraborti: Nonparametric Statistical Inference. Marcel Dekker

8. Parimal Mukhopadhyay: Mathematical Statistics. New Central Book agency

9. Conover:Practical Nonparametric Statistics. Wiley series

10. V.K.Rohatgi and A.K.Md.Ehsanes Saleh: An introduction to probability and statistics Wiley series.

11. Mood AM,Graybill FA, Boe's DC.Introduction to theory of statistics. TMH

12. Paramiteya mariyu aparameteya parikshalu. Telugu Academy

13. K.V.S.Sarma: Statistics Made simple do it yourself on PC.   PHI

14. Gerald Keller: Applied Statistics with Microsoft excel. Duxbury. Thomson Learning

15. Levin, Stephan, Krehbiel, Berension: Statistics for Managers using Microsoft Excel.4th edition. Pearson Publication

16. Hogg, Tanis, Rao.Probability and Statistical Inference. 7th edition. Pearson Publication.

Practical Paper-II

1. Generation of random samples from Uniform (0,1), Uniform (a,b) and exponential distributions.

2. Generation of random samples from Normal and Poisson distributions

3. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions using MS Excel.

4. Fitting of straight line and parabola by the method of least squares

5. Fitting of straight line and parabola by the method of least squares using MS Excel.

6. Fitting of power curves of the type $y=a\,x^b, y=a\,b^x$ and $y=a\,e^{bx}$ by the method of least squares.

7. Fitting of power curves of the type $y=a\,x^b$, $y=a\,b^x$ and $y=a\,e^{bx}$ by the method of least squares using MS Excel

8. Computation of Yule's coefficient of association

9. Computation of Pearson's, Tcherprows coefficient of contingency

10. Computation of correlation coefficient and regression lines for ungrouped data

11. Computation of correlation coefficient, forming regression lines for ungrouped data

12. Computation of correlation coefficient, forming regression lines for grouped data

13. Computation of correlation coefficient, forming regression lines using MS Excel

14. Computation of multiple and partial correlation coefficients

15. Computation of multiple and partial correlation coefficients using MS Excel

16. Computation of correlation ratio

17. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.

18. Small sample tests for single mean and difference of means and correlation coefficient

19. Paired t-test

20. Small sample tests for means(s), paired t-test and correlation coefficient using MS Excel

21. Small sample test for single and difference of variances

22. Small sample test for single and difference of variances using MS Excel

23. x^2- test for goodness of fit and independence of attributes

24. x^2- test for goodness of fit and independence of attributes using MS Excel.

25. Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample runs test.

26. Nonparametric tests for two independent samples (Median test, Wilcoxon Mann Whitney - U test, Wald - Wolfowitz's runs test)

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writing inferences.

THIRD YEAR

Paper - III :
APPLIED STATISTICS

UNIT - I :

Design of Sample Surveys:

Concepts of population, sample, sampling unit, parameter, statistic, sampling errors, sampling distribution, sample frame and standard error.

Principal steps in sample surveys - need for sampling, census versus sample surveys, sampling and non- sampling errors, sources and treatment of non-sampling errors, advantages and limitations of sampling.

Types of sampling: Subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in the following methods.

(i) SRSWR and SRSWOR

(ii) Stratified random sampling with proportional and Neyman allocation, and

(iii) Systematic sampling when N= nk.

Comparison of relative efficiencies. Advantages and disadvantages of above methods of sampling.

UNIT - II :

Analysis of Variance and Design of Experiments

ANOVA - one-way, two-way classifications with one observation per cell -concept of Gauss-Markoff linear model, statement of Cochran's theorem, concept of fixed effect model and random effect model. Expectation of various sums of squares, Mathematical analysis, importance and applications of design of experiments. Principles of experimentation, Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

Unit-III

Time series:- Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares, moving average methods. Growth curves and their fitting- Modified exponential, Gompertz and Logistic curves.

Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

Index Numbers: -Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyer's, Paasche's and Fisher's index numbers, criterion of a good index numbers, problems involved in the construction of index numbers. Fisher's index as ideal index number. Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers.

Official Statistics: - Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in estimation of national income.

Unit-IV

Vital statistics: Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate if natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

Demand Analysis: Introduction. Demand and supply, price elastics of supply and demand. Methods of determining demand and supply curves, Leontief s ,Pigous's methods of determining demand curve from time series data, limitations of these methods Pigou's method from time series data. Pareto law of income distribution curves of concentration.

List of reference books:

1. V.K.Kapoor and S.C.Gupta : Fundamentals of Applied Statistics. Sultan Chand

2. Parimal Mukhopadhyay : Applied Statistics . New Central Book agency.

3. Daroga Singh and Chowdhary: Theory and Analysis of Sample survey designs. , Wiley Eastern.

4. M.R.Saluja : Indian Official Statistics. ISI publications.

5. B.L.Agarwal: Basic Statistics.New Age publications.

6. S.P.Gupta : Statistical Methods. Sultan Chand and Sons.

7. Pratirupa Sidhanthamulu - Telugu Academy.

8. Prayoga Rachana arid Visleshana - Telugu Academy.

14. K.V.S. Sarma: Statistics made simple : do it yourself on PC. PHI

15. Gerald Keller; Applied Statistics with Microsoft excel. Duxbury. Thomson Learning.

15. Levine, Stephan, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel. Pearson Publication.

16. Anuvartita Sankhyaka sastram - Telugu Academy.

17. Arora, Sumeet Arora, S. Arora: Comprehensive Statistical Methods. S.Chand.

Practical Paper - III

Sampling Techniques

Estimation of population mean, population total and variance of these estimates by

1. Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR.

2. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.

3. Systematic sampling with N=nk. Comparison of systematic sampling with Stratified and SRSWOR.

Design of Experiments:

4. ANOVA - one - way classification with equal number of observations

5. **ANOVA - one-way classification with equal number of observations using** MS **Excel.**

6. ANOVA Two-way classification with equal number of observations.

7. **ANOVA Two-way classification with equal number of observations using** MS **Excel**

8. Analysis of CRD. Analysis of RED with and without missing observation

9. **Analysis of CRD. Analysis of RBD with and without missing observation using MS Excel**

10. Analysis of LSD with and without missing observation

11. **Analysis of LSD with and without missing observation using MS Excel.**

12. Comparison of relative efficiency of CRD with RBD and comparison of relative efficiencies of LSD with RBD and CRD.

Time Series Analysis:

13. Measurement of trend by methods of Least squares and moving averages

14. **Measurement of trend by method s of Least squares and moving averages using MS Excel.**

15. Determination of seasonal indices by methods of Ratio to moving averages, Ratio to trend and Link relatives.

16. **Determination of seasonal indices by methods of Ratio to moving averages, Ratio to trend and Link relatives using MS Excel.**

Index Numbers:

17. Computation of simple and all weighted index numbers.

18. Computation of reversal tests.

19. Construction of cost of living index number and wholesale index number.

20. Construction of fixed base and chain base index numbers.

21. **Base shifting, Splicing and Deflation.**

21 (a). Computation of all weighted indices, cost of living index number, Base shifting, splicing and deflation using **MS** Excel.

Vital Statistics:

22. Computation of various Mortality rates, Fertility rates and Re-production rates.

23. Construction of Life Tables and Abridged life tables.

24. Construction of various rates, life tables and abridged life tables using MS Excel

Demand Analysis:

25. Construction of Lorenz curve.

26. Fitting of Pareto law to an income data.

27. Construction of Lorenz curve using MS Excel.

Note : Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MSWord for writing inferences.

THIRD YEAR

Paper-IV:
QUALITY, RELIABILITY AND OPERATIONS RESEARCH
(Elective -I)

Unit-I

Statistical Process Control

Importance of SQC in industry. Statistical basis of Shewart control charts. Construction of control charts for variables (mean, range and standard deviation) and attributes (p , np, and c- charts with fixed and varying sample sizes). Interpretation of control charts. Natural tolerance limits and specification limits, process capability index. Concept of Six sigma and its importance.

Unit - II

Acceptance sampling plans: Producers risk and consumer's risk. Concept of AQL and LTPD. Single and Double sampling plans for attributes and derivation of their OC and ASN functions. Design of single and double sampling plans for attributes using Binomial.

Reliability: Introduction. Hazard function, Exponential distribution as life model, its memory- less property. Reliability function and its estimation. Concepts of censoring and truncation. System reliability - series, parallel and k out of N systems and their reliabilities.

Unit-III

Linear Programming:

Meaning and scope of OR. Convex sets and their properties. Definition of general LPP. Formulation of LPP. Solution of LPP by graphical method. Fundamental theorem of LPP. Simplex algorithm. Concept of artificial variables. Big-M /Penalty method and two-phase simplex methods. Concept of degeneracy and resolving it, Concept of duality, duality as LPP. Dual Primal relationship. Statement of Fundamental theorem of duality. Dual simplex method.

Unit - IV

Transportation, Assignment and Sequencing Problems:

Definition of transportation problem, TPP as a special case of LPP, feasible solutions by North-West and Matrix minimum methods and

VAM. Optimal solution through MODI tableau and stepping stone method for balanced and unbalanced transportation problem. Degeneracy in TP and resolving it. Transshipment problem.

Formulation and description of Assignment problem and its variations. Assignment problem as special case of TP and LPP. Unbalanced assignment problem, traveling salesman problem. Optimal solution using Hungarian method.

Problem of Sequencing. Optimal sequence of N jobs on two and three machines without passing.

List of reference books

1. Kanti Swaroop,P.K.Gupta and ManMohan: Operations Research. Sultan Chand.
2. D.C.Montgomary: Introduction to Statistical Quality Control. Wiley.
3. V.K.Kapoor and S.C.Gupta L Fundamentals of Applied Statistics. Sultan Chand
4. S.K.Sinha: Reliability and life testing. Wiley Eastern
5. L.S.Srinath: Reliability Engineering. Affiliated East-West Press.
6. Gass: Linear Programming. Mc Graw Hill.
7. Hadly : Linrar programming. Addison-Wesley.
8. Wayne L. Winston : Operations Research. Thomson, India edition. 4th edition.
9. S.M.Ross: Probability Models. Harcourt India PVT.Ltd.,
10. Parimal Mukhopadhyay : Applied Statistics. New Central Book agency
11. Anuvartita Sankhyaka sastram - Telugu Academy.
12. R.C.Gupta: Statistical Quality Control.
13. Talia : Operations Research: An Introduction : Mac Millan.
14. Parikriya Parishodhana - Telugu Academy.

Practical Paper -IV

(Elective -1)

Statistical Quality Control

1. Construction of mean, range and standard deviation charts.

2. **Construction of mean, range and standard deviation charts using MS Excel**

3. Construction of p, np and c- charts with fixed and varying sample sizes.

4. **Construction of p, np and c- charts with fixed and varying sample sizes using MS Excel.**

5. Designing of Single sampling plan and Double sampling plan for attributes and construction of their OC and ASN curves

6. **Designing of Single sampling plan and Double sampling plan for attributes and construction of their OC and ASN curves using MS Excel.**

Reliability

7. Computation of reliability for series, parallel and k out of n systems. SComputation of reliability for series, parallel and k out of n systems using MS Excel.

Operations Research:

9. Formulation and graphical solutions of LPP (using different inequality type constraints)

10. Solution of LPP by simplex method.

11. **Solution of LPP by simplex method using TORA**

12. Solution of an LPP using Big-M and two phase simplex methods

13. **Solution of an LPP using Big-M method and two phase simplex method using TORA**

14. Solution of an LPP using principal of duality and dual simplex methods.

15. Solution of an LPP using principal of duality and dual simplex methods using TORA.

16. Formulation and solution of transportation problem using North-West corner rule, Matrix minimum methods and VAM and to test their optimality.

17. Formulation and solution of transportation problem using North-West corner rule, Matrix minimum methods and VAM and to test their optimality using TORA

18. Optimum solution to balanced and unbalanced transportation problems by MODI method (both maximization and minimization cases).

19. Formulation and solution of Assignment problem using Hungarian method (both maximization and minimization cases),

20. Formulation and solution of Assignment problem using Hungarian method (both maximization and minimization cases using TORA

21. Solution of unbalanced Assignment problem.

22. Solution of traveling salesman problem.

23. Solution of sequencing problem—processing of n jobs through two machines and processing of n jobs through three machines.

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MSWord for writing inferences.

B.Sc.
MATHEMATICS

FIRST YEAR

PAPER - I : Differntial Equations & Solid Geometry

SECOND YEAR

PAPER - II : Abstract Algebra & Real Analysis

THIRD YEAR

PAPER - III : Linear Algebra, Multiple Integrals
and Vector Calculus

PAPER - IV : Electives
1. Numerical Analysis
2. Fourier Series and Integral Transforms

B.A. / B.Sc. MATHEMATICS

FIRST YEAR

Paper -1
DIFFERNTIAL EQUATIONS & SOLD GEOMETRY

DIFFERENTIAL EQUATIONS

UNIT -I

Differential equations of the first order and the first degree:

Linear differential equations, Differential equations reducible to liner form Exact Differential Equations, Integrating factors, Change of Variables, Simultaneous total differential Equations, Orthogonal trajectories in cartesian coordinates

Differential equations of the first order but not of the first degree:

Equations solvable for p, Equations solvable for y, Equations solvable for x; Equations that do not contain *x* (or *y),* Equations of the first degree in *x* and *y* - Clairaurt's equation.

UNIT - II

Higher order linear differential equations

Solution of homogeneous linear differential equations of order n with constant coefficients, Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators. Method of undetermined coefficients, Method of variation of parameters, Linear differential equations with non-constant coefficients, The Cauchy - Euler equation

System of linear differential equations:

Solution of a system of linear equations with constant coefficients, An equivalent triangular system. Degenerate Case:

$P_1(D)P_4(D) - P_2(D)P_3(D)=0.$

(Prescribed Text Book: Scope and treatment as in Differential Equations and their Applications by Zafar Ahsan, published by Prentice-Hall of India Pvt. Ltd. New Delhi, Second edition: Sections: -2.5, to 2.9, 3.1, 3.2, 4.20, 5.2 to 5.7, 7.2, 7.3, 7.4.)

Reference Book :

Rai Singhania, *"Ordinary and Partial Differential Equations",*
S. Chand & company, New Delhi.

SOLID GEOMETRY

UNIT-III

The Plane :

Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between to planes, Joint equation of two planes, Orthogonal projection on a plane.

Right Line :

Equations of a line, Angle between a line and a plane, The condition that a given line may lie in a given plane, The condition that two given lines are coplanar, Number of arbitrary constants in the equations of a straight line, Sets of conditions which determine a line, The shortest distance between two lines. The length and equations of the line of shortest distance between two straight lines, length of the perpendicular from a given point to a given line, Intersection of three planes.

The Sphere :

Definition and equation of the sphere, Equation of the sphere through four given points, Plane sections of a sphere. Intersection of two spheres, Equation of a circle. Sphere through a given circle, Intersection of a sphere and a line, Power of a point, Tangent plane. Plane of contact. Polar plane, Pole of a Plane, Conjugate points, Conjugate planes, Angle of intersection of two spheres, Conditions for two spheres to be orthogonal, Radical plane, Coaxial system of spheres, Simplified form of the equation of two spheres.

UNIT-IV

Cones, Cylinders and Conicoids :

Definitions of a cone, vertex, guiding curve, generators, Equation of the cone with a given vertex and guiding curve, Enveloping cone of a sphere. Quadratic of cones with vertex at origin, Condition that the general equation of the second degree should represent a cone.

Condition that a cone may have three mutually perpendicular generators, Intersection of a line and a quadric cone. Tangent lines and tangent plane at a point. Condition that a plane may touch a cone. Reciprocal cones. Intersection of two cones with a common vertex. Right circular cone. Equation of the right circular cone with a given vertex, axis and semi-vertical angle.

Definition of a cylinder, Equation to the cylinder whose generators intersect a given conic and are parallel to a given line, Enveloping cylinder of a sphere. The right circular cylinder, Equation of the right circular cylinder with a given axis and radius.

The general equation of the second degree, shapes of some surfaces, Nature of Ellipsoid, Nature of Hyperboloid of one sheet.

Prescribed Text Book :

Scope as in **Analytical solid Geometry** by shanti Narayan and P.K Mittal, Published by S.Chand & Company Ltd. Seventeenth edition: Sections : 2.4, 2.7, 2.8, 2.9, 3.1 to 3.8, 6.1 to 6.9, 7.1 to 7.8, 8.1 to 8.2.2.)

Reference Book:

P.K. Jain and Khaleel Ahmed, "A Text book of Analytical Geometry of Three Dimensions" Wiley Eastern ltd. 1999.

SEONCD YEAR

Paper – II
ABSTRACT ALGEBRA & REAL ANALYSIS

UNIT - I : GROUPS:

Binary operations- Definition and properties, Groups- Definition and examples, Elementary properties of groups, Finite groups and group composition tables, Subgroups and cyclic subgroups, Cyclic groups-Elementary properties of cyclic groups, Subgroups of finite cyclic groups. Permutations-groups of permutations, Cayley's theorem, orbits, cycles, even and odd permutations, the alternative groups, cosets, the theorem of Lagrange and its converse, Homomorphism, Definition and examples, properties of homomorphism. The kernel of a homomorphism, normal subgroup. factor groups, The fundamental homomorphism theorem, Normal subgroups and Inner automorphisms.

UNIT - II : RINGS:

Definitions and basic properties, homomorphism and isomorphism, Fields, divisors of zero and cancellation laws, Integral Domain, The characteristic of a ring. Rings of polynomials. Polynomials in an indeterminate, Ideals and factor rings, Homomorphism and factor rings, Fundamental homomorphism theorem, Maximal and prime ideals.

Prescribed text book.

Scope and treatment as in A first course in Abstract Algebra by John B. Fraleigh, Seventh edition, Pearson education (low price edition), New Delhi

Part-I: Sections: 2,4,5,6.
Part-II: Sections: 8,9,10.
Part-Ill: Sections:13,14.
Part-IV: Sections: 18,19, 22.1, 22.2, 22.3
Part-V: Sections : 26,27.1 to 27.16.

Reference Books

(1) A first course in Abstract Algebra by John B. Fraleigh, Third edition, Narosa Publishing house.

(2)   Topics in Algebra by I.N.Herstein, Wiley Estern

(3)   Contemporary Abstract Algebra by Joseph A Gallian, Narosa Publishing House.

UNIT - III:

REAL NUMBERS:

The Completeness properties of R, Applications of the supremum property. (No question is to be set from this portion)

Sequences and Series-Sequences and their limits, Limit theorems, Monotone Sequences, Sub-sequences and the Bolzano-Weierstrass theorem, The Cauchy's criterion, Properly divergent sequences, Introduction to series, Absolute convergence, test for absolute convergence, test for non-absolute convergence.

Continuous functions : Continuous functions, combinations of continuous functions, Continuous functions on intervals, Uniform continuity.

UNIT - IV :

DIFFERENTIATION AND INTEGRATION:

The derivative, The Mean value theorem, L'Hospital rules, Taylor's theorem. Riemann integral, Riemann integrable functions, Fundamental theorem.

Prescribed text Book:

Scope as in "Introduction to Real analysis", by Robert G. Bartle and Donald R.Sherbert, John Wiley, third edition, Chapter 2(2.3 to2.4),Chapter 3,(3.1 to 3.7), Chapter 5(5.1 to 5.4),Chapter 6(6.1 to 6.4), Chapter 7(7.1 to 7.3.7), Chapter 9 (9.1 to 9.3.2).

Reference Books:
1.   A course of Mathematicl Analysis by Shanthi Narayana and P.K..Mittal, S.Chand & Company.
2.   Mathematicl Analysis by S.C.Malik and Savita Arora,
        Wiley Eastern Ltd.

FINAL YEAR

Paper - III

LINEAR ALGEBRA, MULTIPLE INTEGRALS AND VECTOR CALCULUS

Part A: Linear Algebra

UNIT - I :

Vector spaces, General properties of vector spaces, Vector subspaces, Algebra of subspaces, Linear combination of vectors. Linear span, Linear sum of two subspaces, Linear independence and dependence of vectors, Basis of vector space, Finite dimensional vector spaces, Dimension of a vector space, Dimension of a subspace. Linear transformations, Linear operators, Range and null space of linear transformations, Rank and nullity of linear transformations, Linear transformations as vectors, Product of linear transformations, Invertible linear transformation.

UNIT - II :

The adjoint or transpose of a linear transformation, Sylvester's law of nullity, Characteristic values and characteristic vectors, Cayley-Hamilton theorem, Diagonalizable operators. Inner product spaces, Euclidean and unitary spaces, Norm or length of a vector, Schwartz inequality, Orthogonality, Orthonormal set, Complete orthonormal set, Gram-Schmidt orthogonalisation process.

Prescribed text book:

Linear Algebra by J.N.Sharma and A.R.Vasista, Krishna Prakasham Mandir, Meerut-250002.

Reference Books:

1. Linear Algebra by Kenneth Hoffman and Ray Kunze, Pearson Education (low priced edition), New Delhi.

2. Linear Algebra by Stephen H. Friedberg et.al, Prentice Hall of India Pvt.ltd. 4th edition 2007.

Part B: Multiple integrals and Vector Calculus

UNIT - III :

Multiple integrals: Introduction, The concept of a plane, Curve, Line integral- Sufficient condition for the existence of the integral. The area of a subset of R^2, Calculation of double integrals, Jordan curve, Area, Change of the order of integration.

Prescribed book:

A Course of Mathematical Analysis by Shanti Narayana and P.K.Mittal, S.Chand Publications. Chapter 16.1 to 16.8

UNIT - IV:

Vector differentiation, Ordinary derivatives of vectors, Continuity, Differentiability, Gradient, Divergence, Curl operators, Formulae involving these operators. Vector integration, Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

Prescribed text book:

Vector Analysis by Murray.R.Spiegel, Schaum series publishing Company, Chapter 3,4,5,6 and 7.

Reference Books:

1. Text book of Vector Analysis by Shanti Narayana and P.K.Mittal, S.Chand and Company Ltd, New Delhi.

2. Mathematical Analysis by S.C.Mallik and Savitha Arora, Wiley Eastern Ltd.

<div align="center">

Paper IV (Elective - 1)

NUMERICAL ANALYSIS

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UNIT - I :

Errors in Numerical Computations: Numbers and their Accuracy, Errors and their Computation, Absolute, Relative and Percentage errors , A general error formula, Error in a series approximation. Solution of Algebraic and Transcendental Equations: The bisection method, The iteration method, The method of false position, Newton-Raphson method, Generalized Newton-Raphson method, Ramanujan's method, Muller's method.

UNIT - II :

Interpolation: Errors in polynomial interpolation, Forward differences, Backward differences, Central differences, Symbolic relations, Detection of errors by use of D.Tables, Differences of a polynomial, Newton's formulae for interpolation, Gauss's central difference formula, Stirlings's central difference formula, Interpolation with unevenly spaced points, Lagrange's formula, Derivation of governing equations, End conditions, Divided differences and their properties, Newton's general interpolation.

UNIT - III :

Curve Fitting: Least squares curve fitting procedures, fitting a straight line, Non linear curve fitting, Curve fitting by a sum of exponentials.

Numerical Differentiation and Numerical Integration: Numerical differentiation, Errors in numerical differentiation, Maximum and minimum values of a tabulated function, Numerical integration, Trapezoidal rule, Simpsons' 1/3 -rule, Simpsons' 3/8 -rule, Boole's and Weddle's rule.

UNIT - IV :

Linear system of equations: Solution of linear systems-Direct methods, Matrix inversion method, Gaussian elimination method, Method of factorization, ill-conditioned linear systems. Iterative methods: Jacobi's method, Gauss-Siedal method.

Numerical Solution of Ordinary Differential Equations: Introduction, Solution by Taylor's Series, Picards method of successive approximations, Euler's method, Modified Euler's method, Runge-Kutta methods, Predictor-Corrector method, Milne's method.

Prescribed Text Book:

Scope as in Introductory methods of Numerical Analysis by S.S.Sastri, Prentice Hall India (4thEdition), Chapter-1(1.2, 1.4, 1, 1.5, 1.6); Chapter-2(2.2-2.7); Chapter-3(3.2, 3.3, 3.7.2, 3.9.1, 3.9.2, 3.10.1, 3.10.2); Chapter - 5 (5.2-5.4.5); Chapter - 6 (6.3.2, 6.3.4, 6.3.7, 6.4); Chapter - 7 (7.2-7.5, 7.6.2).

Reference Books:

1. G. Shanker Rao New Age International Publishers, New- Hyderabad.
2. Finite Differences and Numerical Analysis by H.C Saxena S.Chand and Company, New Delhi.

MODEL CURRCULLUM - B.A /B.Sc

Mathematics: Paper IV (Elective - 2)

FOURIER SERIES AND INTEGRAL TRANSFORMS

UNIT - I :

Fourier series: Fourier series, theorems, Dirichlet's conditions, Fourier series for even and odd functions, Half range Fourier series, Other forms of Fourier series.

Prescribed Text Book: Scope as in *A course of Mathematical Analysis* by Shanthi Narayana and P.K.Mittal, published by S.Chand and Company, Chapter 10.

UNIT - II :

Laplace transforms: Definition of Laplace transform, Linearity property - Piecewise continuous function. Existence of Laplace transforms, Functions of exponential order and of class A. First and second shifting theorems of Laplace transform, Change of scale property - Laplace transform of derivatives, Initial value problem, Laplace transform of integrals, Multiplication by t , Division by t , Laplace transform of periodic functions and error function, Beta function and Gamma functions. Definition of Inverse Laplace transform, Linearity property, First and second shifting theorems of Inverse Laplace transform, Change of scale property, Division by p , Convolution theorem, Heaviside's expansion formula (with proofs and applications).

UNIT - III :

Fourier transforms: Dirichlet's conditions, Fourier integral formula (without proof), Fourier transform, Inverse theorem for Fourier transform, Fourier sine and cosine transforms and their inversion formulae. Linearity property of Fourier transforms, Change of scale property, Shifting theorem, Modulation theorem, Convolution theorem of Fourier transforms, Parseval's identity, Finite Fourier sine transform, Inversion formula for sine transform, Finite Fourier cosine transform, Inversion formula for cosine transform.

UNIT - IV :

Application of Laplace and Fourier transforms: Application of Laplace transforms to the solution of ordinary differential equations

with constant coefficients and variable coefficients, simultaneous ordinary differential equations, partial differential equations. Applications of Fourier transforms to initial and boundary value problems.

Prescribed Text Book:

Scope as in *Integral transforms* by A.R.Vasishta and Dr. R.K.Gupta published by Krishna Prakashan Mandir Pvt. Ltd. Meerut.

Chapter I, Chapter II: all sections except 2.3 and 2.18; Chapter III: section 3.1, 3.2, 3.3, 3.4; Chapter VI: section 6.1 to 6.20 except 6.16; Chapter VII: section 7.1 to 7.4; Chapter VIII: section 8.2.

Reference Book:

Operational Mathematics by R.V.Churchill, McGraw Hill Company.

B.Sc.
ZOOLOGY

FIRST YEAR

PAPER - I : Biology of Invertebrates and Cell Biology

SECOND YEAR

PAPER - II : Biology of Chordates, Embryology, Ecology and Zoogeography

THIRD YEAR

PAPER - III : Animal Physiology, Genetics and Evolutions

PAPER - IV : Applied Zoology

B.Sc. Zoology

FIRST YEAR

Theory Paper - I
BIOLOGY OF INVERTEBRATES AND CELL BIOLOGY

UNIT - I :

1.0 Protozoa to Annelida

1.1   Phylum Protozoa: Generalcharacters and outline classification up to classes. Type Study : *Paramecium*

1.2.   Phylum Porifera : General characters and outline classification up to classes. Type study : *Sycon;* Canal system in Sponges.

1.3.   Phylum Coelenterata : General characters and outline classification up to classes. Type study : *Obelia;* Polymorphism in Coelenterates : Corals and Coral reef formation.

1.4.   Phylum Platyhelminthes: General characters and outline classification up to classes. Type study : *Fasciola hepatica.*

1.5.   Phylum Nemathelminthes: General characters and outline classification up to classes. Type of study : *Ascaris lumbricoides*.

1.6.   Phylum Annelida: General characters and outline classification up to classes. Type study : Leech : Coelom and coelomoducts in Annelids.

UNIT - II :

2.0 Arthropoda to Hemichordata

2.1   Phylum Arthropoda: Genera characters and outline classification of up to classes. Type study : *Peripatus* - Characters and Significance.

2.2.   Phylum Mollusca: General characters and outline classification of up to classes. Type study : *Pila;* Pearl formation in Molluscs.

2.3.   Phylum Echinodermata: General characters and outline classification of up to classes. Type study : Star fish.

2.4.   General characters of Hemichordata : Structure and affinities of Balanoglossus.

UNIT - III :

3.0 Cell Biology

3.1 Cell theory

3.2. Ultra structure of Animal cell

3.3. Structure of Plasma membrane - Fluid-mosaic model. Transport functions of Plasma membrane- Passive transport. active transport (Antiport. symport and uniport) and bulk transport.

3.4. Structure and functions of Endoplasmic reticulum Golgi body, Ribosomes, lysosomes and Mitochondrion.

3.5. Chromosomes - nomenclature types and structure. Giant chromosomes - Polytene and Lampbrush chromosomes.

3.6. Cell division - Cell-cycle stages (G_1 S. G_2 and M phases), Cell-cycle check points and regulation. Mitosis: Meiosis - and its significance.

UNIT - IV :

4.0 Biomolecules of the cell

4.1 Carbohydrates :
    4.1.1 Classification of Carbohydrates
    4.1.2 Structure of Monosaccharides (Glucose and Fructose)
    4.1.3 Structure of Disaccharides (Lactose and Sucrose)
    4.1.4 Structure of Polysaccharides (Starch, Glycogen and Chitin)

4.2 Proteins:
    4.2.1 Amino acids: General properties. nomenclature. classification and structure.
    4.2.2 Classification of proteins based on functions, chemical nature and nutrition, peptide bond and structure (Primary, secondary, tertiary and quaternary structures)

4.3 Lipids:
    4.3.1 Classification. Structure of Fatty acids (Saturated and unsaturated).
    4.3.2 Triacylglycerols. Phospolipids (Lecithin and cephalin) and Steroids (Cholesterol).

4.4 Nucleic acids:
    4.4.1 Structure of purines, pyrimidines. ribose and deoxyribose sugars.

4.4.2 Watson and Crick model of DNA-Nucleoside, Nucleotide. Chargaff's rule. Structure of RNA. Types of RNA -rRNA. tRNA and mRNA.

Practical Paper - I

INVERTEBRATES:

1. Observation of the following slides specimens models:

    Protozoa : *Amoeba, Elphidium, Monocystis, Paramoecium* - binary fission and Conjugation, *Vorticella*.

    Poriferea : *Spongilla, Euspongia, Sycon,* Spicules, Gemmule. TS&LS of *Sycon*

    Coelentereate : *Physalia, Velella, Aurelia. Corallium, Gorgonia, Pennatula, Obelia colony,* Meduse

    Platyhelminthes and Nemathelminthes: *Planaria, Fasciola,* Larval stages of *Fasciola;* Miracidium, Redia, Cercaria, Echinococcus gramulosus, Taenia solium *Schistosoma haematobium, Ascaris (Male & Female). T.S. Ascaris.*

    Annelida : *Nereis, Aphrodite, Hirudo.* Trochonphore larva. T.S. of leech.

    Arthropoda : Cancer, Palaemon, Sacculina, Scorpion, Limulus, Julus, Scolopendra, Locust, Mantis. Butterfly. Honeybee. Peripatus. Anopheles and Culex mouthparts (male and female) Housefly Mouthparts

    Mollusca: *Chiton, Pila, Unio. Pteredo. Sepia. Octopus. Nautilus,* Glochidium larva.

    Echinodermata : Asterias, Ophiothrix Fehinus. Clypeaster, Cucumaria, Antedon, Bipinnaria larya.

    Hemichordata: Balanoglossus. Tornaria larva.

2. **DESSECTIONS**

    Praw: Nervous system, mounting of statocyst and appendages.
    Pila: Nervous system, Mounting of radula.

CELL BIOLOGY :

1. Identification of stages from permanent slides showing Mitosis and Meiosis.

2. Squash preparation of onion garlic root tip for Mitotic chromosomes.

3. Identification of salivary gland chromosomes and polytene chromosomes (Photographs or figures).

SECOND YEAR

Theory Paper - II
BIOLOGY OF CHORDATES, EMBRYOLOGY, ECOLOGY AND ZOOGEOGRAPHY

UNIT - I

1.0. Protochordata to Amphibia

1.1. Protochordates: Salient features of Urochordata and Cephalochordata. Structure and life-history *of Herdmania.* Significance of retrogressive metamorphosis

1.2. General characters of Chordates

1.3. General characters of Cyclostomes

1.4. General characters of fishes, classification up to sub-class level with examples

    1.4.1. Type study - *Scoliodon* (Morphology, digestive system, respiratory system, circulatory system, urinogenital system, nervous system and sense organs.

    1.4.2. Types of scales.

1.5. General characters and classification of Amphibia up to order level.

    1.5.1. Type study - *Rana* (Morphology, digestive system, respiratory system, circulatory system, excretory system, nervous system and reproductive system and sense organs)

    1.5.2. Parental care in amphibia.

UNIT-II

2.0. Reptilia to Mammalia

2.1. General characters and classification of Reptilia up to order level

    2.1.1. Type study - *Calotes:* (Morphology. digestive system, respiratory system, circulatory system, nervous system and urinogenital system

    2.2. General characters and classifications of Aves up to order level with examples

    2.2.1. Type study - *Pigeon (Columba livia)* (Exoskeleton, respiratory system, circulatory system, excretory system, nervous system and reproductive system).

2.2.2. Flight adaptations in birds

2.2.3. Significance of Migration in birds

2.3. General characters and classification of Mammalia up to order level with examples

2.3.1. Dentition in Mammals

UNIT - III

3.0. Embryology

3.1. Gametogensis and Fertilization

3.2. Types of eggs and cleavages

3.3. Development of frog up to gastrulation and formation of primary germ layers

3.4. Foetal membranes and their significance

3.5. Placenta: Types and functions

UNIT - IV

4.0. Ecology

4.1. Biogeochemical cycles - Gaseous cycles of Nitrogen and Carbon; Sedimentary cycle - phosphorus.

4.2. Definition of Community - Habitat and ecological niche

4.2.1. Community interactions: Brief account of Competition, predation, mutualism, commensalisms and parasitism

4.2.2. Ecological succession

4.3. Population ecology: Density, mortality and natality

4.3.1. Growth curves

4.3.2. Population regulation mechanisms - both biotic and abiotic

4.3.3. Zoogeography: Zoogeographical realms. Fauna of Oriental, Ethiopian and Australian regions.

Practical Paper - II

CHORDATA, EMBRYOLOGY AND ECOLOGY

Observation of the following slides/specimens/models:

1. Protochordata: *Herdmania, Amphioxus, Amphioxus* T.S. through pharynx.

2. Cyclostomata: *Petromyzon* and *Myxine*

3. Pisces: *Pristis, Torpedo. Channa, Pleurenectes, Hippocampus, Exocoetus, Echeneis, Labeo, Catla, Clarius, Anguilla.* Scales of fishes.

4. Amphibia: *Ichthyophis, Amblystoma, Siren,* Axolotl larva, *Rana, Hyla, Alytes.*

5. Reptilia: *Draco, Chamaeleon, Uromastix,* Russels viper, *Naja, Bungarus, Echis carinata*

6. Aves: *Picus, Psittacula, Eudynamis, Bubo, Alcedo, Coracius, Archaeopteryx*

7. Mammalia: *Ornithorhynchus, Tachyglossus, Macropus, Erinacius Pteropus, Funambulus, Mam's, Loris.*

DISSECTIONS:

1. V, VII, IX and X cranial nerves of Scoliodon

2. Arterial system of Scoliodon (afferent, efferent)

3. Brain of Scoliodon

OSTEOLOGY:

1. Appendicular skeletons of Varanus, Pigeon and Rabbit

EMBRYOLOGY:

1. Mounting of sperms (Grasshopper/Rat)

2. Observations of following slides/models T.S. of testis and ovary (Rat/Rabbit/Human)

3. Different stages of cleavage (2-cell, 4-cell and 8-cell), Morula

4. Blastulaand gastrula of frog.

5. 24 hours, 48 hours and 72 hours of chick embryo

ECOLOGY:

1. Determination of pH in a given sample

2. Estimation of dissolved oxygen in the given samples at different temperatures.

3. Estimation of salinity (chloride) of water in the given samples.

4. Estimation of hardness of water in terms of Carbonates and bicarbonates in the given samples.

THIRD YEAR

Theory Paper - III
ANIMAL PHYSIOLOGY, GENETICS AND EVOLUTIONS

UNIT -I

1.0. Physiology of Digestion

1.1. Definition of digestion and types of digestion - extra and intracellular.

1.2. Digestion of carbohydrates, proteins, lipids and cellulose digestion.

1.3. Absorption and assimilation of digested food materials.

1.4. Gastrointestinal hormones - control of digestion.

2.0. Physiology of respiration

2.1. Types of respiration - external and internal respiration.

2.2. Structure .of mammalian lungs and gaseous exchange.

2.3. Transport of oxygen - formation of oxyhemoglobin and affinity of hemoglobin to oxygen, oxygen dissociation curves.

2.4. Transport of CO_2 - Chloride shift, Bohr effect.

2.5. Cellular respiration - Main steps of glycolysis, Krebs cycle, electron transport, Oxidative phosporylation and ATP production (Chemiosmotic theory).

3.0. Physiology of Circulation

3.1. Open and closed circulation

3.2. Structure of mammalian heart and its working mechanism - Heart beat and cardiac cycle. Myogenic and neurogenic hearts.

3.3. Regulation of heart rate - Tachycardia and Bradycardia.

4.0. Physiology of Excretion

4.1. Definition of excretion

4.2. Forms of nitrogenous waste products and their formation; classification of animals on the basis of excretory products.

4.3. Gross organization of mammalian excretory system and structure of kidney.

4.4. Structure and function of Nephron - Counter current mechanism.

UNIT-II

1.0. Physiology of muscle contraction

1.1   General structure and types of muscles.

1.2   Ultra structure of skeletal muscles.

1.3   Sliding filament mechanism of muscle contraction

1.4   Chemical changes during muscle contraction - role of calcium, ATP utilization and its replenishment.

2.0. Physiology of nerve impulse

2.1.   Structure of nerve cell.

2.2.   Nature of nerve impulse - resting potential and action potential. Properties of nerve impulse - threshold value, refractory period, all or none response.

2.3.   Conduction of nerve impulse along an axon - local circuit theory and salutatory conduction theory

2.4.   Structure of synapse, mechanism of synaptic transmission - electrical and chemical transmissions.

3.0. Physiology of Endocrine system

3.1.   Relationship between hypothalamus and pituitary gland.

3.2.   Hormones of hypothalamus.

3.3.   Hormones of Adenohypophysis and Neurohypophysis.

3.4.   Hormones of pineal gland, thyroid gland, parathyroid, thymus, adrenal and pancreas.

3.5.   Endocrine control of mammalian reproduction - Male and female hormones - Hormonal control of menstrual cycle in humans.

4.0. Physiology of Homeostasis

4.1.   Concept of Homeostasis and its basic working mechanism.

4.2.   Mechanism of Homeostasis - Giving three illustrations viz., Hormonal control of glucose levels, Water and ionic regulation by freshwater and marine animals and temperature regulation in man.

UNIT - III

1.0. Genetics

1.1. Mendel's laws - Law of segregation and independent assortment; Gene interaction - Incomplete dominance, co-dominance and epistasis

1.2. Identification of DNA as genetic material - Griffith's experiment and Hershey - Chase experiment

1.3. Central dogma of molecular biology - Brief account of DNA replication (Semi- conservative method). Replication fork (Continuous and discontinuous synthesis); Transcription - Brief account of initiation, elongation and termination in eukaryotes; Translation; Genetic code; gene regulation as exemplified by lac operon.

1.4. Human karyotyping, barr bodies and Lyon hypothesis and Amniocentesis, chromosomal disorders - Autosomal and sex chromosomal.

2.0. Organic Evolution

2.1. Genetic basis of Evolution, Gene pool and gene frequencies, Hardy - Weinberg's Law, Force of destabilization, natural selection, genetic drift, Mutation, Isolation and Migration

2.2. Speciation - Allopatry and sympatry.

2.3. Evolution of Man

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Practical Paper - III

ANIMAL PHYSIOLOGY, GENETICS AND EVOLUTIONS

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ANIMAL PHYSIOLOGY

1.   Identification of carbohydrates, proteins and lipids.

2.   Unit oxygen consumption in an aquatic animal [Fish or crab]

3.   Qualitative analysis of excretory products.

4.   Demonstration of salivary amylase.

GENETICS

5.   A, B, O blood group identification.

6.   Problems based on Blood grouping.

7. Karyotyping of human chromosomes [Human Karyotype figure on paper should be cut in to different sets of chromosomes and students are asked to arrange them in an order and comment on the ideogram].

8. Identification of genetic syndromes given on charts.

9. Problems based on Mendelian inheritance [at least three problems for each for the laws of segregation and law of independent assortment]

Reference Books

1. 'Essentials of Animal Physiology' by SC Rastogi

2. 'Animal Physiology' by H.C. Nigam

3. 'Biology' by Campbell & Reece.

4. 'Animal Physiology' - Agarwal, R.A. Srivastava, Kaushal, Anil and Kumar.

5. 'Animal Physiology and Biochemistry' by Dr. B. Annadurai

6. 'Principles of Animal Physiology' by Christopher D. Moyes, Patricia M Schulte.

7. 'Biology: The Sciences of Life' by R.A. Wallace, G.P. Sanders and R.J. Ferl.

8. 'Biology: Concepts and Applications' by Starr

9. 'Genetics' Vol-I by C.B. Power, Himalaya Publishing House Pvt. Ltd.

10. 'Genetics' by Strickberger

11. 'Genetics' by P.K. Gupta

12. 'Cell Biology, Genetics, Evolution and Ecology' by P.S. Varma and VK Agrawal; S, Chand and Company.

13. 'Principles of Genetics' by S.B. Basu and M. Hossain

14. 'Principles of Genetics' by Gardner, Simmons and Smustard.

15. 'Principles of Genetics' by H.Robert and Tamasin.

16. 'Genetics' by P.S. Verma and VK Agarwal.

17. 'Organic Evolution' by MP Arora and Chandrakanta.

18. 'Organic Evolution' by N. Arumugam.

19. 'Animal nutrition' by P.Mc Donald, R.A. Edwards, J.F.D. Greenhalgh, C.A. Morgan.

THIRD YEAR

(THEORY PAPER - IV) APPLIED ZOOLOGY

UNIT - I

1.0. Fisheries and Aquaculture

- 1.1. Capture fisheries - Introduction
- 1.2. Types of fisheries, Fishery resource from Freshwater
- 1.3. Fin-fish and shell fisheries.
- 1.4. Fishing gears and fishing crafts.
- 1.5. Site selection criteria
- 1.6. Aquaculture systems
- 1.7. Induced breeding
- 1.8. Hatchery design and Management
- 1.9. Shrimp and prawn culture
- 1.10. Post-harvest technology
- 1.11. Preservation and processing - Freezing, solar drying, Canning, Salting smoking

UNIT - II

2.0. Clinical Science

2.1. Hematology

- 2.1.1. Blood composition and functions
- 2.1.2. Blood groups and Rh factor, transfusion problems
- 2.1.3. Blood diseases - Anemia, Leukemia, Leucocytosis, Leucopaenia
- 2.1.4. Biopsy and autopsy - Clinical importance

2.2. Immunology

- 2.2.1. Types of immunity - Innate and acquired, organs of immune system
- 2.2.2. Antigens - Haptens and epitopes
- 2.2.3. Structure and biological properties of human immunoglobulin G (IgG)

2.2.4. Humoral immunity and cell mediated immunity, B and T-cells

2.2.5. Hypersensitivity - immediate and delayed

2.3. **Important Human Parasites**

2.3.1. Blood parasites (Structure and clinical significance of plasmodium.

2.3.2. Intestinal parasites - structure and clinical significance of Entamoeba, Griardia, Taenia, Ancylostoma, Enterobius

UNIT-III

3.0. Animal Biotechnology:

3.1. Animal Biotechnology: Scope of Biotechnology, Cloning vectors - Characteristics of vectors, Plasmids

3.2. Gene Cloning - Enzymatic cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation.

3.3. Transgenesis and Production of transgenic animals (Fish and Goat)

3.4. Application of Stem Cell technology in Cell based therapy (Diabetes and Parkinson's diseases)

Practical Paper - IV
FISHERIES AND AQUACULTURE

1.0. Identification of important Freshwater fishes (Minimum 10)

2.0. Identification of important edible prawns and crabs (Minimum 5)

FIELD WORK:

Field work is compulsory. Field trip to local fisheries/ aquaculture unit is to be conducted and certified Held note book should be submitted at the time of practical examination.

CLINICAL SCIENCE:

1 . Identification of the following protozoan parasites

a) *Entamoeba histolystica*

b) *Giardia intestinalis*

c) *Balantidium coli*

d) *Trypanosoma gambiense*

e) *Plasmodium – Anytwo stages*

2. Identification of the following helminth parasites

   a) *Taenia solium*
   b) *Ascaris (Male and Female)*
   c) *Enterobius vermicularis*
   d) *Dracanculus medinensis*
   e) *Ancylostoma duodenale*

3. Blood cell counting - RBC and WBC

4. Estimation of Haemoglobin (Sahli's Method)

5. Differential count

6. Identification of Sugar in urine

ANIMAL BIOTECHNOLOGY:

1.0. Identification of vectors (charts or photographs)

2.0. Identification of Genetic disorders (charts or photographs)

3.0. Identification of transgenic animals (charts or photographs)

B.Sc.
BIO-TECHNOLOGY

FIRST YEAR

Paper - I : Cell Biology and Genetics

SECOND YEAR

Paper - II : Biological Chemistry and Microbiology

THIRD YEAR

Paper - III : Molecular Biology, Genetic Engineering and Immunology

Paper - IV : Applications of Biotechnology

B.Sc. (Biotechnology)

FIRST YEAR

Paper - I
CELL BIOLOGY AND GENETICS

Unit - l : Cell Structure, Function and Cell Division

1.1 Cells as basic units of living organisms

   Viral, bacterial, fungal, plant and animal cells

1.2 Ultra structure of prokaryotic cell (Cell membrane, plasmids)

1.3 Ultra structure of eukaryotic cell (Cell wall, cell membrane, mitochondria, chloroplast, endoplasmic reticulum, Golgi apparatus, vacuoles).

1.4 Chromosome organization in Prokaryotes and Eukaryotes

1.5 Structure of specialized chromosomes (Polytene and Lamp Brush)

1.6 Cell Division and Cell Cycle

1.7 Significance of mitosis and meiosis

UNIT - II : Mendel's Laws and Mechanism of Inheritance

2.1 Mendel's experiments - Factors contributing to success of Mendel's experiments

2.2 Law of segregation - Monohybrid ratio

2.3 Law of Independent assortment - Dihybrids, Trihybrids

2.4 Deviation from Mendel's Laws - partial or incomplete dominance, co-dominance

2.5 Penetrance and expressivity, pheotropism

2.6 Epistatic gene interaction - Modified dihybrid ratios (12:3:1; 9:7; 15:1; 9:3:4:, 9:6:1; 13:3)

2.7 Genes and environment - phenocopies.

2.8 Linkage and recombination - Discovery of linkage, cytological proof of crossing over Recombination frequency and map distance Interference and co incidence Mitotic crossing over in Drosophila

2.9   Mechanism of sex determination-genie balance theory - Drosophila Homogametic and Heterogametic theory (Human, Mamalian, Birds)

2.10 X - linked inheritance (eg. Haemophilia)

UNIT - III : Structure and Function of Nucleic Acids

3.1   DNA as the genetic material - Griffiths-experiments on transformation in Streptococcus pneumoniae. Avery, McEleod and Mc Carty's experiment Hershey - Chase experiments' with radio-labelled T2 bacteriophage

3.2   RNA as genetic material - Tobacco Mosaic Virus

3.3   Structure of DNA - Watson and Crick Model Forms of DNA - A, B and Z forms of DNA, Super coiled and related DNA - Role of topoisomerases

3.4   DNA Replication - Models of .DNA replication (Semi-conservative, non-conservative models)

      Mechanisms of DNA replication - Linear and circular - Rolling circle and theta mechanism of replication

3.6. DNA damage and Repair

UNIT - IV : Concepts of Biostatistics and Bioinnformatics

4.1   Concept-of probability, basic laws and its application to Mendelian segre gation. Concept of probability distribution. Binomial and Poisson distributions, Normal distribution and their application to biology

4.2   Concept of sampling and sampling distribution. Concept of test of hypothesis. Applications of West statistics to biological problems/ data: Chi-square, statistic applications in biology

4.3   Simple Regression and Correlation. Concept of analysis of variance (one way classification).

4.4   Introduction to Bioinformatics

      Biological Databases - Nucleotide sequence and Protein databases, their utilization in Biotechnology, Storage of biological data in databanks, data retrieval from databases and their utilization

SECOND YEAR

Paper - II
BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

Unit - I : BIOMOLECULES

1.1 Carbohydrates: Importance, classification and properties

1.2 Structure, configuration and biochemical importance of monosaccharides (glucose and fructose)

1.3 Dissacharides - Structures and biochemical importance of sucrose and trehalose Physiologically important glycosides (streptomycin, cardiac glycosides, ouabain)

1.4 Structure and function of homo polysaccharides - starch, inulin, cellulose and glycogen Stricture and function of heteropolysaccharides - Hyaluronic acid

1.5 Proteins: Classification, structure and properties amino acids.

1.6 Peptide bond - Synthesis and characters

1.7 Primary, secondary, tertiary and quaternary structures of proteins

1.8 Lipids: Fatty acids: Saturated and unsaturate.

1.9 Triacylglycerols, Spingolipids, Sterols Phospholipids (phosphatidic acid, phosphatidylcholine)

1.10 Enzymes: Classification and nomenclature of enzymes Kinetics of enzyme catalyzed reactions

1.11 Factors influencing enzymatic reactions
   (a) pH   (c) Substrate concentration
   (b) Temperature   (d) Enzyme concentration

1.12 Enzyme Inhibition - Competitive and non-competitive

UNIT - II : Intermediary Metabolism

2.1 Glycolysis

2.2 Citric acid cycle

2.3 Gluconeogenesis and its significance

2.4 Mitochondria! electron transport Chemiosmotic theory of ATP synthesis

2.5 B-Oxidation of fatty acid

2.6 Deamination, decarboxylation and transamination reactions of amino acids

2.7 Catabolism of amino acids - phenyl alanine and tyrosine (Phenylketonuria and albinism)

2.8 Photosynthesis - Light reaction and photophosphorylation

2.9 Carbon Assimilation

Unit-III : Fundamentals of Microbiology

3.1 Outlines of classification of microorganisms

3.2 Structure and general characters of Viruses, Bacteria, Fungi and Micro Algae (one example from each group)

3.3 Disease causing pathogens and their symptoms (examples: Typhoid, HIV only)

3.4 Isolation, identification and preservation of microorganisms (Bacteria)

3.5 Identification methods of Fungi and useful Micro Algae

3.6 Methods of sterilization

3.7 Bacterial reproduction and growth kinetics (batch and continuous cultures)

3.8 Pure cultures and cultural characteristics

UNIT - IV : Principles and Applications of Biophysical Techniques

4.1 Microscopy - Light, Inverted, Fluorescent and Electron microscopy

4.2 Colorimetry - Beer - Lambert's Law

4.3 UV-VIS Spectrophotomefry

4.4 Chromatography

(a) Paper   (b) Thin Layer   (c) Ion-exchange   (d) Gel-filtration

4.5 Electrophoresis - Native gels and SDS-PAGE, Agarose

4.6 Centrifugation and filtration - Basic Principles

4.7 Dialysis and lyopholization

4.8 Radio isotopes and their-use in biology

Practical Paper - II

Practicals :

1. Preparation of Normal, Molar and Molal solutions

2. Preparation of Buffers (Acidic, Neutral and Alkaline Buffers)

3. Qualitative tests of sugars, amino acids and lipids

4. Estimations of protein by Biuret method

5. Estimation of total sugars by anthron method

6. Separation of amino acids by paper Chromatography

7. Electrophoretic separation of proteins (SDS-PAGE)

8. Technique of Micrometry (Stage and ocular)

9. Enzyme assay - Catalase or Invertase (or any other enzyme)

10. Preparation of routine microbiological media)

11 Isolation of common non-pathogenic bacteria

12. Staining and identification of bacteria - E.coli, Pseudomonas, Bacillus and Staphylococcus

Recommended Books

1. Biochemistry - By Dr.U.Satyanarayana, U.Chakrapani
2. Biochemistry - By J.L.Jain
3. Biochemistry - By Conn and Stumpf
4. Biochemistry - By Lehninger
5. Textbook of Medical Biochemistry - By S. Ramakrishnan, R. Rajan, and; K.G. Prasannan (Orient Longman)
6. Biochemistry - By Stryer
7. Biochemistry - By Voet and Voet
8. Biochemistry (Jaypee) - By Vasudevan
9. Biochemistry - By Daivd Rawn
10. General Biochemistry - By J.H. Well
11. Biochemistry - By K. Trehan
12. Biochemical Methods - By S. Sadasivam and A. Manickam
13. An introduction to Practical Biochemistry - By T. PIummer
14. Experimental Biochemistry-A student Companion - By V. Deshapande and B. Sasidhar Rao
15. Practical Biochemistry- By Upadhayay, Wilson and Wilson, Wilson & Walker
16. Biochemistry - Viva Series
17. Text Book of Microbiology - By Ananthanarayan and Paniker
18. Microbiology - By Cappuccino (Pearson Education)
19. Microbiology - By Tortora (Pearson Education)
20. Microbiology - B.J.Pelczar, E.S.N.Cfan and N.R.Kreig, McGraw Hill Publ.
21. General Microbiology - By Stanier, R.YJ.L. Ingrahm, M.L. Wheel is & P.R.Painle
21. General Microbiology - By Powar (Vol. I and Vol. II)
22. Practical Microbiology - By Aneja

THIRD YEAR

Paper - III
MOLECULAR BIOLOGY,
GENETIC ENGINEERING AND IMMUNOLOGY

UNIT - I : Gene and Genome organization

1.1 Organization of nuclear genome - Genes and gene numbers - essential and non essential genes

1.2 Denaturation and renaturation of DNA - Tm values and Cot curves

1.3 Kinetic classes of DNA - Single copy sequences, and repeated sequences. Inverted, tandem and palindromic repeats

1.4 Satellite DNA

1 5 Mitochondnal genome organization (eg: Human)

1 6 Chloroplast genome organization in plants

1 7 Organization of eukaryotic genes - Exons, introns, promoters and terminators

1 8 Gene families and clusters - eg. Globin gene, histones and ribosomal genes.

UNIT-II : Gene expression and Gene regulation

2 1 Prokaryotic and Eukaryotic Transcription
Post-transcriptional modifications (Capping, polyadenylation, splicing and alternate splicing)

2 2 Translation
Genetic code and its features, Wobble Hypothesis
Synthesis of polypeptides - initiation, elongation and termination in prokaryotes and eukaryotes

2 3 Regulation of gene expression in prokaryotes
and eukaryotes Operon concept in bacteria - Lac operon

UNIT - III : Recombinant DNA Technology

3 1 Enzymes used in gene cloning : Restriction endonucleases, Ligases, Phosphatases, Methylases, Kinases

3 2 Cloning vehicles - Plasmids, Cosmids, Phage vectors, Shuttle vectors

3 3   Baculovirus vector system, Expression vectors - expression cassettes

3 4   Construction of genomic and cDNA libraries

3 5   Identification of cloned genes

3 6   Principles involved in Blotting Techniques - Souther, Northern and Western

3 7   Principles and Applications of PCR Technology

3 8   DNA Finger printing technique and its applications

UNIT - IV : Basics of Immunology

2.1   introduction to immune system - Organs and cells of the immune system

2 2   Antigens, Haptens - physico-chemical characteristics

2 3   Structure of different immunoglobulins and their functions - Primary and secondary antibody responses

2 4   Antigen - Antibody Reaction

2 5   The Major Histocompatibility gene complex and its role in organ transplantation, Generation of antibody diversity

2 6   Hypersensitivity - Coombs classification, Types of hypersensitivity

2 7   Autoimmune diseases - mechanisms of auto immunity

Practicals :

1   isolation of DNA from plant/animal/bacterial cells

2   Analysis of DNA by agarose gel electrophoresis

3   Restriction digestion of DNA

4   Immuno-diffusion test

5   ELlSATest

6   Microagglutmation using microtiter plates (eg. ABO and Rh Blood grouping)

7   Viability tests of cells/bacteria (Evans blue test or Trypan blue test)

8   Coomb's test

9   Preparation of competent cells of Bacteria

10   Bacterial transformation and selection of transformants under pressure (antibiotic).

Recommended Books

1 Concepts in Biotechnology - By D. Balasubramanian, C.F.A. Bryce, K. Dharmalingam, J. Green and Kunthala Jayaraman

2 Essential Immunology - By I. Roitt, Publ: Blackwell

3 Molecular Biology of the Gene - By Watson, Hopkins, Goberts, Steitz and Weiner (Pearson Education)

4 Cell and Molecular Biology - By Robertis & Robertis, Publ: Waverly

5 Text Book of Biotechnology - By H.K. Das (Wiley Publications)

6 Gene Structure & Expression - By J.D. Howkins, Publ: Cambridge

7 Genetic Engineering - By R. Williamson, Publ: Academic Press

8 Test Book of Molecular Biology - By K.S. Sastry, G. Padmanabhan & C. Subramanyan, Publ: Macmillan India

9 Microbial Genetics - By S.R. Maloy, J.E. Cronan & D. Freifelder, Publ: Jones & Barlett

10 Principles of Gene Manipulation - By R.W. Old & S.B. Primrose, Publ: Blackwell

11 Genes - By B. Lewin   - Oxford Univ. Press

12 Molecular Biology & Biotechnol - By H.D. Kumar, Publ: Vikas

13 immunology - By G. Reever & I. Todd, Publ: Blackwell

14 From Genes to Clones - By E.L Winnacker, Publ: Panima, New Delhi

15 Methods for General & Molecular Bacteriology   - By P. Gerhardf et al., Publ: ASM

16 Molecular Biotechnology - By G.R. Click and J.J. Pasternak, Publ: Panima

17 Recombmant DNA - By J.D. Watson et al., Publ: Scikentific American Books

18 Immuno diagnostics - By S.C. Rastogi, Publ: New Age

19 Molecular Biology - By D. Freifelder, Publ: Narosa

20 Genes and Genomes - By Maxine Singer and Paul Berg

21 Cell and Molecular Biology - By S.C. Rastogi

22 Genetic Engineering and Biotechnology - By V. Kumar Gera

23 Essentials of Biotechnology - By P.K. Gupta

24 Introduction to Applied Biology and Biotechnology
   - By K. Vaidyanath, K. Pratap Reddy and K. Satya Prasad

25 Laboratory Experiments in Microbiology - By M. Gopal Reddy, M.N. Reddy, D.V.R; Sai Gopal and K.V. Mallaiah

26   Immunology - By Kubey

27   Gene Biotechnology - By Jogdand

28   Genome - T.A. Brown

29   Gene Cloning - T.A. Brown

30   Biotechnology. IPRs and Biodiversity - By M.B. Rao and Manjula Guru (Pearson Education)

31   Introduction to Biotechnology   - By W.J. Thieman and M.A. Palladino (Pearson Education)

30   Genetic Engineering - By Boylan (Pearson Education)

31   New Frontiers in Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

32   Basic Concepts of Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

33   Advances in Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

34   Genetic Engineering - By Sandhya Mitra.

PAPER - IV
APPLICATIONS OF BIOTECHNOLOGY

UNIT - I : **Animal Biotechnology**

1 1   Introduction to animal biotechnology

1 2   Principles of animal cell culture - culture vessels

1 3   Cell culture media preparation, sterilization, types of cultures

1 4   Establishment and preservation of cell lines

15   Explants and cell disaggregation

1 6   Culture of cells and tissues (including Stem cells and their application)

1 7   *in vitro* fertilization and embryo transfer technology

1 8   Methods of gene transfer - Microinjection and viral mediated gene transfer techniques

       Production of transgenic animals and molecular pharming

1 9   Principles of Ex *vivo* and *In vivo* gene therapy

UNIT - II : Plant Biotechnology

2 1 Composition of media (Murashige and Skoog's and Gamborg's only)

Preparation of media and methods of sterilizations

2 2 Role of plant growth regulators in differentiation

2 3 Induction of callus

2 4 Meristem culture and production of virus free plants

Clonal propagation of plants on a commercial scale (Somatic embryogenesis and organogenesis)

2 5 Mass cultivation of cell cultures and process engineering - batch and continuous cultures, Bioreactors

2 6 Production of commercially useful compounds by plant cell culture

2 7 Methods of gene transfer techniques *(Agrobacterium,* Microprojectile bombardment)

2 8 Applications of recombimant DMA technology in agriculture

29 Production of therapeutic proteins from transgenic plants

UNIT - III : Industrial Biotechnology

3 1 Introduction to industrial biotechnology.

3 2 Primary and secondary metabolic products of microorganisms

3 3 Screening and isolation and preservation of industrial microorganisms

3 4 Principles of Fermentation technology

3 5 Commercial production of fuels and chemicals by microbial fermentations

3 6 Fermentative production of microbial enzymes (amylases, proteases), and antibiotics

3 7 Fermentative production of foods and dairy products

3 8 Animal cells as bioreactors; characteristics of bioreactors, expression and over production of targeted proteins - human growth hormones - production of á and â-interferons monoclonal antibodies

3 9 Good manufacturing practices, Biosafety issues, Bioethics

310 intellectual Property Rights and Patenting issues

Unit - IV : Environmental Biotechnology

4 1   introduction to environmental biotechnology

4 2   Renewable and non-renewable energy resources

4 3   Conventional energy sources and their impact on environmental

4 4   Non-conventional fuels and their impact on environment (biogas, bioethanol, microbial hydrogen production)

4 5   Microbiological quality of milk, food and water

4 6   Microbiological treatment of municipal and industrial effluents

4 7   Microbial degradation of pesticides and toxic chemicals

4 8   Biopesticides and Biofertilizers (Nitrogen fixing, phosphate solubilizing microorganisms)

4 9   Microbial ore leaching

410   Introduction to Bioremediation

Practicals :

1.   Preparation of media, and initiation of callus from any one selected plant species

2.   Micropropagation of plants (any one)

3.   Preparation of synthetic seeds

4.   Production of wine using common yeast

5.   Production of hydrogen or biogas using cow/cattle dung

6.   isolation of microbes from soil or industrial effluents

7.   Preparation of media and culture of animal cells/tissues

8.   Cell disaggregation and cell counting

9.   Cytotoxicity of the cells using the dye MTT method

10. Estimation of BOD in water samples

11. Production of alcohol by fermentation and Estimation of alcohol by colorimetry

12. Production of biofertilizers *(Azolla)*

13. Growth curves of bacteria, Measurement of growth in liquid cultures
       Quality testing of milk by MBRT

Recommended Books

1   Strategies m Transgenic Animal Sciences - By Glemn M.M. and James M. Robl ASM Press 2000.

2   Practical Biotechnology - Methods and Protocols - By S. Janarthanan and S. Vincent (Universities Press)

3   Animal Cells as Bioreactors - By Terence Gartoright, Cambridge Univ Press

4   Molecular Biotechnology - By Chinnarayappa (Universities Press)

5   Principles and Practice of Animal Tissue Culture - By Sudha Gangal (Universities Press)

6   introduction to Veterinary Genetics -By F.W. Nicholas, Oxford University Press.

7   Text Book of Biotechnology - By H.K. Das (Wiley Publications)

8   Biotechnology -By H.J. Rehm and G. Reed Vol-1-86 VIH Publications, Germany

9   Guide for the care and use of lab animals National Academy Press.

10   Biogas Technology - By b.T. Nijaguna

11   Biotechnology - I - By R.S. Setty and G.R. Veena   .

12   Biotechnology - II - By R S. Setty and V. Sreekrishna

13. Introduction to Plan Tissue Culture - By M.K. Razdan (Oxford and IBH Publishing Company, New Delhi)

14. Introduction to Plant Biotechnology - By H.S. Chawla (Oxford and IBH Publishing comp., New Delhi.)

15. Biotechnology - By. K. Trehan

16. Industrial Microbiology - By L.E. Casida

17. Food Microbiology - By M.R. Adams and M.O. Moss

18. Introduction to Biotechnology - By M.R. Adams and M.O. Moss

19. Frontiers of Plant Tissue Culture - By T.A. Thorpe

20. Plant Tissue Culture - Theory and Practice - By S.S. Bhojwani and M.K. Razdan.

21. Biotechnology - By U. Satyanarayana

22. Plant Biotechnology New Products and Applications - By J. Hammond, P. McGarvey, and V. Yusibov

23. Plant Tissue Culture - Basic and Applied - By Timir Baran Jha and B. Ghosh

24. Essentials of Biotechnology for Students - By Satya N. Das

25. Plant Tissue Culture - By Kalyan Kumar De

26. Bioethics - Readings and Cases - By B.A. Brody and H.T. Engelhardt. Jr. (Pearson Education)

27. Biotechnology, IPRs and Biodiversity - By M.B. Rao and Manjula Guru (Pearson Education)

24. Bioprocess Engineering - By Shuler (Pearson Education)

25. Emerging Trends in Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

26. Modern Concepts in Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

27. Essential of Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

28. Fundamentals of Medical Biotechnology - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

29. Biotechnology in the Welfare on Mankind - By Irfan Ali Khan and Atiya Khanum, Volume I, (Ukaaz Publications)

30. Biotechnology in the Welfare of Mankind - By Irfan Ali Khan and Atiya Khanum, Volume II, (Ukaaz Publications)

31. Gene. Genomics and Genetic Engineering - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

B.Sc.
INDUSTRIAL MICROBIOLOGY

INDUSTRIAL MICROBIOLOGY
FIRST YEAR

PAPER - I

FUNDAMENTALS OF INDUSTRIAL MICROBIOLOGY, BIOSTASTISTICS TOOLS AND TECHNIQUES

1. **Introduction**

    Discovery of microbial world, The experiments of Pasteur, The era of the discovery of antibiotics, The discovery of the Anaerobic life, The physiological significance of fermentation

2. **Classification,** characteristics and ultra-structure of microbes: bacteria, algae, fungi, actinomycetes, mycoplasma and viruses.

3. **Fundamentals of sterilization** Preparation of media methods, Isolation of micro organisms, Culture preservation and stability, preservation of microbes, serial subculture, preservation by over laying culture with mineral oil, lyophilization or freeze drying.

4. **Biostastics Tools and Techniques** Basic idea of probability, distribution patterns, normal binomial and poisson distribution, sampling methods, mean, mode and median, chisquare, statistical analysis of variance, transformation, exponential and logarithmic functions.

5. **General account of instrumentation** Paper Chromatography, Thin layer chromatography, Column chromatography, Gas chromatography, Affinity chromatography, Gel filtration, basic principles and usage of pH meter, absorption and emission spectroscopy, principle and law of absorption of radiation, use of densitometry, fluorimetry, colorimetry, polarography, centrifugation principles and applications. Microscopy: Simple microscopy, phase contrast microscopy, fluorescence and electron microscopy.

6. **Computer Hardware and Software,** harword graphics, lotus and DOS computer application in fermentation technology justification and planning.

PAPER - I
PRACTICALS

1. Preparation of media, autoclaving and sterilization of glassware, maintenance of culture room.

2. Isolation and maintenance of microbes of different groups.

3. Single spore culture

4. Camera lucida drawing.

5. Standard plate count.

6. Haemo cytometer.

7. Isolation of phytopathogens.

8. Isolation of soil Microorganisms.

9. Isolation of thermophilic Microorganisms.

10. Bacterial smear preparation.

11. Simple staining of bacteria.

12. Differential staining of bacteria.

13. Staining of bacterial spores.

14. Bacterial motility.

15. Biostatics problems: mean, mode, median, chi-square test.

16. Paper chromatographic separation of carbohydrates, amino acids, pigments and organic acids.

17. Measurements of pH of fruit juice.

18. Electrophoretic separation of protein.

19. Centrifugal separation of proteins.

20. Absorption spectra of protein nucleic acids and pigments.

21. Description and identification of some common fungi, algae and bacteria.

22. Microbiological instruments:
    a. Autoclave
    b. Hot air oven
    c. Microscope
    d. pH meter
    e. Electrophoresis
    f. Spectrophotometer colorimeter
    g. Centrifuge
    h. BOD incubator.

PAPER- II

MICROBIAL AND MOLECULAR GENETICS, MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY.

1. **Physiological properties** Diffusion, gaseous exchange, osmosis, plasmolysis, biochemical properties of membrane, passive and active transport.

2. **Photosynthesis** Photo synthetic microbes, oxygenic/non oxygenic reaction centres, electron transport, photophosphorylation, Calvin cycle (dark reaction) phosphoenol carboxylase, photorespiration and its significance.

3. **Respiratory pathways** Respiratory pathways, breakdown of carbohydrates through Glycolysis, Krebs cycle, fermentation, pentose phosphate pathway, oxidative and substrate level phosphorylation, significance of Krebs cycle, gluconeogenesis, regulation of glucogenesis and glycogenolysis.

4. **Nitrogen metabolism** Nitrogen fixation in symbiotic and free living system, photosynthetic systems, oxygen and hydrogen regulation of nitrogen fixation nitrification, denitrification and ammonifying bacteria, transamination and deamination reactions.

5. **Methylotrophs** Methanogens and methylotrophs, sulphur utilizing bacteria, sulphate reduction pathway, economic importance of methylotrophs and sulphur utilizing bacteria, use of nucleotides as nitrogen source for growing of certain micro organisms (pathway of nucleic acid break down).

6. **Carbohydrates** Lipids and aminoacids, classification of carbohydrates, chemical structure and property and starch, cellulose, glycogen, synthesis of purines and pyramidines saturated and unsaturated fatty acids, biosynthesis of fatty acids, distribution and function of lipids and microorganisms, degradation of lipids by alpha, beta and mega oxidation, lipids peroxidation, structure of amino acids and classification of essential aminoacids based on polarity.

7. **Enzymes** Classification, coenzyme, cofactor, thermodynamics explanation of coenzyme catalysis, reaction orders derivation of Michaelis-Menton equation, competitive and non competitive

inhibition, Kinetics of allosteric regulation of enzymes. Isozymes, factors contributing to catalytic efficiency of enzymes.

8. **Nucleic acids** DNA as genetic material, structure of DNA and RNA, DNA replication (conservative and semi conservative replication, conformational flexibility of DNA) replication in eukaryotes. The genetic code central dogma, reverse transcriptase gene,transcription polymerases, transcription product of DNA, t RNA, mRNA and r RNA, synthesis of RNA in eucaryotes and prokaryotes, catabolite effect, operative and repressors post- transcriptional processing of RNA.

9. **Molecular biology of protein synthesis** Translation and protein synthesis in eukaryotes and prokaryotes. RNA synthesis, activation of amino acids, inhibitors of protein synthesis. Gene expression, catabolite repression. Regulation of gene expression, operon concept. Open Catabolite Activator Protein (CAP), positive and negative control and gene expression in prokaryotes. Lac operon, Britton and Davidson model of gene regulation in eukaryotes.

10. **Mutations** Molecular mechanism of mutation, forward and reverse mutation, transition, transversion, chemical induced mutations, radiations and base analogues induced mutations mutation frequency applications of mutations mechanisms of repair, repair of radiation induced damage, SOS repair, transcriptional repair and dark repair.

11. **Genetic recombination in bacteria,** transformation, transduction and conjugation, use of transformation, transduction and conjugation in genetic mapping, preparation of genetic maps.

12. **Extra chromosomal genetic materials,** plasmids cosmids, transposons insertion sequence over lapping gene, silent genes, exon and intron, evolutionary significance of silent gene, ribonucleic protein, genetic recombinant DNA technology.

PRACTICALS

1. Isolation of antibiotic resistant bacteria.

2. Replica plate technique for isolation of mutants.

3. Measurement of mutation frequency in bacteria.

4. Demonstration of lysogeny in Escherichia coli.

5. Mutant isolation by gradient plate technique.

6. Location of site of mutation by using plasmid curing agent acrydine orange.

7. Isolation and purification of DNA.

8. Isolation and purification of RNA.

9. Effect of UV light on mutation frequency in bacteria.

10. Demonstration of photo repair mechanism.

11. Extraction and identification of lipids by thin layer chromatography.

12. Estimation of glycogen in bacterial cell.

13. Estimation of alkaline phosphatase activity.

14. Derivation of Michalis- Menton constant of alkaline phosphatase.

15. Measurement of competitive inhibition of ammonium uptake using structural analogue methyl amine.

16. Change in protein conformation due to ph, heat, ionic concentration by observing ultraviolet.

17. Separation of isozyme by polyacrylamide electrophoresis.

18. Measurement of relative enzyme activity of cellulase.

19. Measurement of cellulases by reducing sugar assay test.

20. Demonstration of plasmolysis, Osmosis, Active and Transport mechanism.

21. Measurement of nitrate uptake by microorganisms.

22. Measurement of ammonium uptake by microorganisms.

23. Estimation of nitrate and nitrite reduced by microorganisms.

24. Demonstration of evolution of oxygen in light and uptake of oxygen in dark by photosynthetic microorganisms.

25. Demonstration of photosynthesis, electron transport by 2,6, dichlorophenol indophenol reduction test.

26. Effect of different inhibitors of dichlorophenol indophenol reduction.

THIRD YEAR

PAPER- III

ENVIRONMENTAL AND AGRICULTURE MICROBIOLOGY

1. **Environment:** Soil, water and air environment. Microbes and concepts of environment. Environment induced genetic and physiological adaption in microbes. Microbial population of air, water and soil.

2. **Biogeochemical cycling:** The carbon cycle Trophic relationship. Microbial mobilization and immobilization of carbon within the biosphere.

3. **Population interaction:** Neutralism, commensalism, synergies mutualism. Microbe- microbe interaction, plant- microbe interaction. Animal- microbe interaction. Competition, commensalism, parasitisms, predation.

4. Soil fertility and management of agricultural soils, influence of available nitrogen on soil fertility, crop rotation, soil management practices.

5. Microbial diseases of crops and their control symptoms, mechanisms of microbial pathogenicity. Transmission of plant pathogens, viral diseases, viroid diseases, bacterial diseases, fungal diseases.

6. Pesticide microbiology, biomagnifications, biodegradation, microbiology control pesticide disease.

7. Solid waste disposal, sanitary land fills composting.

8. Treatment of liquid waste, sewage treatment, primary treatment, secondary treatment, tertiary treatment, disinfection.

9. Treatment and safety of water supplies, disinfection of potable water, bacterial indicators of water safety, standards for tolerable levels of fecal contamination.

10. Biodegradation of environmental pollutants. Alkyl- Benzyl sulphonates and oil pollution.

11. Nitrogen fertilizers, symbiotic association, *Rhizobium, Frankia, Azospirillum, Azotobacter, Cyanobacteria*.

12. Production and quality control in biofertilizers, microbes, assessment

of nitrogen fixing ability of different strain under controlled and field conditions, direct and indirect methods, culture production, fermenter, storage culture, carrier, packing, quality control, ISI standards, inoculums requirements, packing marketing and storage, inoculums requirements, methods of applications.

PAPER - III
PRACTICALS

1. Isolation of microorganisms from air.
2. Isolation of microorganisms from water.
3. Isolation of microorganisms from soil.
4. Isolation of microorganisms from bacteriophage in water samples.
5. Total count of bacteria from water.
6. Isolation and counting of fecal bacteria and water analysis.
7. IMVIC test for faecal bacteria and water analysis.
8. Measurement of chloride, phosphorus and nitrates in water sample.
9. Biochemical test for identification of different bacteria from water.
10. Estimation of BOD and COD of water sample.
11. Standard methods of water analysis.
12. Nodulation by Rhizobium.
13. Counting of number of nodules from legume plants.
14. Isolation of VAM spores from soil sample.
15. Identification of VAM spores.
16. Demonstration of nitrogen fixating ability of bacteria in different nitrogen media.
17. Demonstration of nitrogen fixation by Gas liquid chromatography.
18. Measurement of total phosphate, nitrate, nitrite and ammonium in soil.
19. Measurement of organic matter in soil.
20. Isolation of free living nitrogen fixer from soil.
21. Demonstration of Mycorrhizal spores in the soil.

PAPER- IV

FOOD MICROBIOLOGY, FERMENTATION TECHNOLOGY AND IMMUNOBIOTECHNOLOGY AND TISSUE CULTURE.

1. Food spoilage, representative spoilage process, spoilage of fruits and vegetables, meats, other foods, indicators of human pathogens associated with food.

2. Food preservation (General account)

3. Microbiological product of food fermented and ented diary products.

    (b) Indian Food, fermented meats, leaving of breads, alcoholic beverages, single cell protein.

    (c) Fermentation Technology.

4. The fermentation industry.

    Selection of industrial microorganisms, production, process of fermentation, media aeration, pH, temperature, batch versus continuous, culture immobilized enzymes downstream processing and product recovery and quality control of industrial products.

5. Production of pharmaceuticals, antibiotics, penicillin, Vit B12.

6. Production of organic acids; citric acid, lactic acid.

7. Production of amino acids; lysine, glutamic acid.

8. Production of enzymes, protease, amylase, production of solvents, acetone-butanol, production of fuels, ethanol and hydrogen.

9. Microbially enhanced recovery of mineral resources, bioleaching of metals, oil recovery.

10. Biodegradation: paper wood, plant textiles, metal corrosion.

11. Mushroom cultivation.

12. History and scope of immunology, types of immunity, physiology of immune response, antigen- antibody reaction, immunoglobulins, structure, distribution and function.

13. Production of vaccines, Monoclonal antibodies (Hybridoma technology).

14. Biotechnology programmes and regulation: role of international organizations in biotechnology; Govt. programmes for biotechnology development; Governmental regulations of recombinant DNA research; regulations for disposal of biohazardous materials, patenting biotechnology processes and products; mycotoxins hazards in the production of fungal products health hazards during microbial spoilage carcinogenic, mutagenic ceratogenic biologicals.

15. Basic concepts of plant tissue and animal cell culture.

PAPER - IV
PRACTICALS

1. Measurement and production of citric acid by *A. niger.*
2. Measurement and production of ethanol by *Saccharomyces.*
3. Demonstration of IAA production by soil fungi.
4. Demonstration for the cultivation of mushroom.
5. Measurement of invitro production of IAA by soil fungi.
6. Demonstration for the identification of mushroom by spore print.
7. Demonstration for the transformation of steroids.
8. Demonstration for the production of amino acids by soil fungi.
9. Estimation of streptomycin.
10. Isolation and identification of microorganisms of spoiled food.
11. Isolation *of A.flavus* from spoiled food.
12. In vitro production of aflatoxin by *A.flavus*
13. Inhibitory effect of low temperature on microbial contamination of milk.
14. Titration of antigens and antibodies.
15. Precipitation reaction of antigen and antibody.
16. Callus formation by root organ culture from egg plant.

Reference books:

Microbiology	Pelzer,Reid & Chan
Microbiology	RA.Atlas
General Microbiology	Powar & Daginwala
General Microbiology	R.Y.Stainer

Microbiology	K.S.Bilgrani & R.N Verm
Microbiology	Hans G.Schiegal
General Microbiology	P.D.Sharma & Kumar
Microbiology	S.B.Sullia
Microbiology	K.S.Bilgrami & HC Dube
General Microbiology	Purohit
General Microbiology	Devis & Harper
The Microbiological world	R.Y.Stainere *et.al.*
The Text Book of Microbiology	R.Ananthanarayana
Microbiological methods	C.H.Collins & D.N.Iyre
Microbiology	G.Guru
Fundamentals Principles of Microbiology	Corpenter
The prokaryotes Vol I & II	M.P.Stayn
An Introduction of Bacteria	V.Sinha *et. al*
Statistics	Mishra & Mishra
Statistics	D.N.Elhance
Tools & Techniques	Welson & Goulding
Lab Techniques in Biology	Swaroop, Pathak and Arora
Fermentation Technology	Whittaker
Principles of genetics	E.J.Gardner
Genes IV	Levin
The genetics of Bacteria and viruses	William Hayes
Principles of Biochemistry	Lehninger
Microbial Biochemistry	Moat
Outlines of Biochemistry	Moat & Foster
Microbial Energetics	Deves
Biochemistry	Keshv. Trehan
Soil microbiology	Martin Alexander
Soil microbiology	N.S.Subba Rao
Soil microbiology	Maruthi
Soil microbiology	M.Alexander
Pesticide Microbiology	Hills & Wright
Plant Diseases	R.H.Singh
Plant Pathology	R.S.Malhotra

Principal of Plant Infectier	Vender Phank
Agricultural Microbiology	N.S.Ranga Swamy
Plant & Soil Microbiology	N.S.Subba Rao
Biology Nitrogen Fixation	N.S.Subba Rao
Modern Plant Pathology	K.S.Bilgrani & H.C.Dube
Mycology	R.S.Meharothro
Mycorrhiza	A.Verma & B.Hock
Atmospheric biopopulation	S.J.Tilak
Aeromicrobiology	Frazier
Modern Microbiology	J.M.Jay
Modern Microbiology	Bunwant
Standard Methods for Water Analysis	APHA
Industrial Microbiology	A.H.Patel
Industrial Microbiology	Priscatt & Dumm
Fermentation Technology	Whittaker
Methods in Microbiology	J.R.Nerris, D.J.Road & A.K.Verma
Biology of Cyanobacteria	Carr & Whittar
Nitrogen fixation	Sprent & Sprent
Immunology	Davis
Immunology	G.P.Talwar
Microbiology Laboratory Manual	S.M.Reddy & S.Ram Reddy
Microbiology Vol. I to IV	S.M.Reddy *et. al.*

B.Sc. COMPUTER SCIENCE

FIRST YEAR

THEORY PAPER - I
PC SOFTWARE AND 'C' PROGRAMMING

UNIT – I : Fundamentals of Computers

Computer definition – Types of Computer – Logical Organization of a Digital Computer – Memory: Main Memory : RAM, ROM and Cache – Secondary Memory : Magnetic type, Floppy disk, Hard disk, Compact disk – Input devices – Output devices – Operating system : Definition, functions of an operating system, Types of Operating systems : Brief details of batch processing, Multi Programming, multi tasking, time sharing, real time operating systems – Introduction to DOS, DOS internal commands, DOS External Commands – Introduction to Windows, Desktop, File, Folder, My Computer, My documents, Recycle bin, Internet Explorer, Windows Explorer – Types of Programming Languages.

UNIT – II : MS Word and MS Power Point

Word Basics : Starting word, Creating a new document, Opening prexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Printing.

Formatting Your Text and Documents : Auto format, Line spacing, margins, Borders and Shading. Working with Headers and Footers: Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

Tables : Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width.

Graphics : Importing graphics, Clip part, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates : Template types, using templates, exploring templates, modifying templates.

Macros : Macro, Recording macros, editing macros, running a macro.

Mail Merge : mail Merge concept, Main document, data sources, merging data source and main document. Overview of word menu options word basic tool bar.

Power Point : Basics, Terminology, Getting started, Views.

Creating Presentations : Using auto content wizard, Using blank presentation option, Using design template option, adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

UNIT – III : MS Excel and MS Access

MS Access

Creating a Simple Database and Tables : Creating a contacts Databases with wizard, The Access Table Wizard, Creating Database Tables without the wizard, Field Names, Data Types and Properties, Adding, deleting fields, renaming the fields in a table.

Forms: The Form Wizard, Saving Forms, Modifying Forms.

Entering and Editing Data : Adding Records, Duplicating previous entries without Retyping, Undo, Correcting Entries, Global Replacements, Moving from Record to Record in a table.

Finding, Sorting and Displaying Data: Queries and Dynasets, Creating and using select queries, Returning to the Query Design, Multilevel Sorts, Finding incomplete matches, Showing All Records after a Query, Saving Queries, Crosstab Queries.

Printing Reports : Simple table, Form and Database printing, Defining advanced Reports, Manual Reporting, properties in Reports, Saving Reports.

Relational Databases: Flat Versus Relational, Types of Relationships, Viewing Relationships, Defining and Redefining Relationships, Creating and Deleting Relationships.

MS Excel

Excel Basics: Overview of Excel features, Getting started, Creating a new worksheet, Selecting cells, Entering and editing text, Entering and editing Numbers, entering and editing Formulas, Referencing cells, moving cells, copying cells, sorting cell data, inserting rows,

inserting columns, Inserting cells, Deleting parts of a worksheet, clearing parts of a worksheet.

Formatting : Page setup, changing column widths and Row heights, auto format, changing font sizes and Attributes, centering text across columns, using border buttons and Commands, changing colours and shading, hiding rows and columns.

Introduction to functions: Parts of a functions, Functions Requiring Add-ins, The Function Wizard.

Examples functions by category : Data and time functions, Engineering functions,Math and Trig functions, Statistical functions, Text functions.

Excel Charts : Chart parts and terminology, Instant charts with the chard wizard, creation of different types of charts, printing charts, deleting charts – Linking in Excel.

Excel Graphics : Creating and placing graphic objects, Resizing Graphics, Drawing Lines and Shapes.

UNIT – IV : C Language fundamentals

Introducton – 'C' Fundamentals : Programming – High Level Languages – compiling programs – Integrated Development Envoronments – Language Interpreters – Compiling your first program – Running your program – understanding your first program – comments – variables, Data types, and Arithmetic Expressions : working with variables – Understanding Data types and constants – working with Arithmetic Expressions – The Assignment operators – The printf function – The scanf function.

Decision making : The if statement – the if else construct – Nested if statements – The else if construct – The switch statement – Boolean variables – The conditional operator – program looping : The for statement – Relational operators – Nested for loops – The while statement – The do statement – The break statement – The continue statement – working with Arrays : Defining an array – Initializing Arrays – character Arrays – The const Qualifier – Multidimensional arrays- variable length Arrays. Working with Functions : Defining a Function-Arguments and Local variables – Returning Function Results – Function calling – Declaring Return Types and Argument types – Top Down programming – Functions and Arrays – global variables – Automatic and static variables – Recursive Functions.

UNIT – V : Programming in C

Working with structures : Defining structure – Functions and structures – Initializing structures – Array of structures – structures containing structures – structures containing Arrays – Structure variants – Character strings : Arrays of characters – variable length character strings – Escape characters – character strings, structures and arrays – character operations.

Pointers : Defining a pointer variable – using pointers in Expressions – pointers and structures (Exclude Linked List – Pointers and Functions – pointers and Arrays – operations on pointers – pointers and Memory address. Operations on Bits : Bit operators – Bit fields

The preprocessor : The # define statement – The # operator – The #include statement – conditional compilation. More on Data Types : Enumerated Data Types – The typedef statement – Data Type conversions Input and Output Operations in "C" : Character I/O – formatted I/O – Input and Output Operations with Files – Special functions for working with Files.

Miscellaneous and Advanced Features : The Goto Statement, the null statement, working with unions the comma operator-type qualifiers.

Prescribed Books :

1. Peter Norton, Introduction to Computers, Sixty edition Tata McGraw Hill (2007).

2. Ron Mansfield, Working in Microsoft Office, Tata McGraw Hill (2008) (Chapters : 4 to 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 25, 28, 30, 31, 33, 34, 35)

3. Stephen G Kochan, Programming in C, Third Edition, Pearson Education (2007) (Chapters: 1 to 14, 16, 17)

Reference Books :

1. Michael Miller, Absolute Beginners Guide to Computer Basics, Fourth Edition, Pearson Education (2007).

2. Deborah Morley, Charles S. Parker, Under Standing Computers today and tomorrow, 11th Edition, Thomson (2007).

3. Ed Bott, Woody Leonhard, Using Microsoft Office 2007, Pearson Education (2007).

4. Beyron S Gottfried, Programming with C, Second Edition, Tata McGraw Hill (2007).

5. Ashok N. Kamathane, Programming with ANSI and Turbo C, Pearson Education (2008).

6. Rajaraman, Introduction to Information Technology, PHI.

7. Balaguruswamy .E., Fundamentals of Computing, TMH (2008).

FIRST YEAR

PRACTICAL PAPER - I
PRODUCTIVITY TOOLS AND
'C' LAB PRODUCTIVITY TOOLS LAB CYCLE

MS-WORD

1. Design a visiting card for Managing Director of a Company with following specification

    i. Size of visiting card is 3.5" x 2"

    ii. Name of a company with big font using Water Mark

    iii. Phone number, fax number and e-mail address with appropriate symbols

    iv. Office and residence address separated by line.

2. Create letter head of accompany

    i. Name of Company on the top of the page with big font and good style

    ii. Phone numbers, fax numbers, e-mail address with appropriate symbols

    iii. Main products manufactured to be described at the bottom

    iv. Slogans if any should be specified in bold at the bottom

3. Creation of your Bio-Data : consisting Name, email-id, Contact Address, Carrier Objective, Educational Qualifications, Social activities, achievements.

MS-POWER POINT

1. Make a Power point presentation on your strengths, weaknesses, hobbies, factors that waste your time.

2. Make a Power point presentation on any Current affair (Not less than 8 slides)

3. Make a Power point presentation to represent your College profile.

4. Make a Power point presentation of all the details of the books that you had studied in B.Sc. First Year.

MS-ACCESS

1. **Create a database using MS-ACCESS with atleast 5 records**

   TABLE 1 STRUCTURE : REGISTER NUMBER NAME DOB GENDER CLASS
   TABLE 2 STRUCTURE : REGISTER NUMBER M1 M2 M3 M4 M5 TOTAL

   Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following queries: Show the list of students with the following fields as one query

   REGISTER NUMBER NAME **GENDER TOTALMARKS**

2. **Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports:**

   Reports must have following columns

   Reports with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and TOTAL

   Report2 with REGISTER NUMBER, TOTAL , PERCENTAGE.

3. **Create a database using MS-ACCESS with at least 5 records**

   TABLE1 STRUCTURE:EMP-CODE EMP-NAME AGE GENDER DOB

   TABLE2 STRUCTURE:EMP-CODE BASIC-PAY

   Maintain the relationship between two tables with EMP-CODE as a Primary Key generate the following reports:

   REPORT 1: EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY

   REPORT 2: EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY

MS-EXCEL

1. **Create an electronic spreadsheet in which you enter the following decimal numbers and convert into Octal, Hexadecimal and Binary numbers Vice versa.**

   Decimal Numbers: 35, 68, 95,165,225,355,375,465
   Binary Numbers: 101, 1101, 111011, 10001, 110011001, 111011111.

2. **The ABC Company shows the sales of different products for 5 years. Create column chart, 3D-column and Bar chart for the following data**

YEAR PRODUCT-1 PRODUCT-2 PRODUCT-3 PRODUCT-4

2003 1000 800 900 1000
2004 800 80 500 900
2005 1200 190 400 800
2006 400 200 300 1000
2007 1800 400 400 1200

3. **Create a suitable examination data base and find the sum of the marks(total) of each student and respective class secured by the student rules:**

Pass if marks in each subject >=35
Distinction if average>=75
First class if average>=60 but <75
Second class if average>=50 but <60
Third class if average>=35 but <50
Fail if marks in any subject is <35
Display average marks of the class, subject wise and pass percentage.

C-PROGRAMMING LAB CYCLE

1. Program for
   i. Sum of factors of a number
   ii. Sum of digits of a number

2. Program to check whether a given number is
   i. Prime number or not
   ii. Perfect number or not
   iii. Armstrong number or not

3. Program using recursion for
   i. Factorial of a given number
   ii. Fibonacci series
4. Program for roots of a quadratic equation

5. Program using functions
   i. With out return value
   ii. With return value
   iii. With parameters iv. With out parameters

6. Program to find largest/smallest of n numbers by using arrays

7. Program for sorting an array

8. Program for matrix addition & subtraction

9. Program for matrix multiplication

10. Program for transpose of a given matrix

11 . Program for (with and without string functions)
    i.   Comparison of two strings
    ii. Concatenation of two strings
    iii. Length of a string

12. Program to process student information. Student structure consists Sno, Sname, Marks in 6 subjects, Total, average. Calculate total and average of n students and assign grade with following criteria.

    Grade A : All pass and avg >=75
    Grade B: All pass and avg>=60 and avg<75
    Grade C: All pass and avg>=50 and avg<60
    Grade D: All pass and avg>=40 and avg<50
    Grade E: If fails in one or more subjects.

13. Program for (i) Nesting of Structure (ii) Passing structures to functions.

14. Program to demonstrate (i) Unions (ii) enumerated data types.

15. Program for sum of diagonal elements of a square matrix?

16. Program to access-(i) array elements (ii) Structure elements using pointers.

17. Program for sorting strings using pointers.

18. Program to count number of (i) words (ii) lines (iii) Special Characters in a given text.

19. Program to create a file to store and retrieve strings using fputs () and fgets ().

20. Program to create a file to store and update employee records. The employee record consists (ENO, ENAME, DEPTNO, DEPTNAME, BASICSALARY, HRA, DA, DEDUCTION, TOTALSALARY and NETSALARY.

21. Program to evaluate following expressions.

22. Program to find Square root of a given no.

23. Program to create table of Triangular Numbers.

24. Program for reversing digits of a no.

25. Program for Base Conversion.

SECOND YEAR

THEORY PAPER - II
OBJECT ORIENTED PROGRAMMING WITH JAVA AND DATA STRUCTURES.

UNIT - 1: Java Fundamentals

Fundamentals of Object Oriented programming : Object Oriented paradigm - Basic concepts of Object Oriented Programming - Benefits of OOP - Applications of OOP.

Java Evolution : Java Features - How Java differs from C and C++ - Java and Internet - Java and World Wide Web - Web Browsers - Hardware and Software Requirements - Java Environment. Overview of Java Language: Simple Java Program - Java Program Structure - Java Tokens- Java Statements - Implementing a Java Program - Java Virtual Machine - Command Line Arguments. Constants, Variables and Data types: Constants - Variables - Data types - Declaration of Variables- Giving Values to variables- Scope of Variables-Symbolic Constants-Type Casting. (Chapters: 1,2,3,4)

UNIT - 2: Oops Concepts in Java

Operators and Expressions: Arithmetic Operators - Relational Operators- Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operators - Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions - Precedence of Arithmetic Operators - Operator Precedence and Associativity.

Decision Making and Branching: Decision Making with If statement - Simple If Statement-If else Statement-Nesting If else Statement- the elseif Ladder-The switch Statement - The ?: operator.

Decision Making and Looping: The while statement - The do statement - The for statement - Jumps in Loops. Class , Objects and Methods: Defining a Class - Fields Declaration - Methods Declaration - Creating.

Objects - Accessing class members - Constructors - Methods Overloading - Static Members - Nesting of Methods - Inheritance - Overriding Methods - Final Variables and Methods - Final Classes - Abstract Methods and Classes - Visibility Control. (Chapters : 5,6,7,8)

UNIT - 3: Packages and Interfaces in Java

Arrays, Strings and Vectors: One-dimensional Arrays-creating an Array - Two dimensional Arrays - Strings - Vectors - Wrapper Classes - Enumerated Types.

Interfaces: Multiple Inheritance : Defining Interfaces - Extending Interfaces - Implementing Interfaces - Accessing Interface Variables.

Packages: Java API Packages - Using system Packages - Naming Conventions - Creating Packages - Accessing a Package - Using a Package - Adding a Class to a Package - Hiding Classes - Static Import. (CHAPTERS: 9,10,11)

UNIT - 4: Multithreaded programming and Applets.

Multithreaded Programming: Creating Threads - Extending the Thread Class - Stopping and Blocking a Thread - Life Cycle of a Thread - Using Thread Methods - Thread Exceptions - Thread Priority -Synchronization. Managing Errors and Exceptions: Types of Errors - Exceptions - Syntax of Exception Handling Code - Multiple Catch Statements - Using Finally Statement - Throwing our own Exceptions - Using Exceptions for debugging.

Applet Programming: How Applets differ from Applications - Preparing to write Applets - Building Applet Code - Applet Life Cycle - Creating an executable Applet - Designing a WebPage - Applet Tag - Adding Applet to HTML file - Running the Applet - More about Applet Tag - Passing parameters to Applets - Aligning the display - More about HTML tags - Displaying Numerical Values - Getting Input from the user. (Chapters: 12, 13, 14)

UNIT - 5: Data Structures

Sorting: Bubble Sort - Selection Sort - Insertion Sort - Quick Sort- Stacks and Queues: Stacks - Queues - Circular Queue - Deques - Priority Queue - Parsing Arithmetic Expressions - Linked List: Simple Linked List - Finding and Deleting Specified Links - Double Ended Lists - Abstract Data types - Sorted Lists - Doubly Linked Lists - Advanced Sorting : Quick Sort - Binary Trees : Tree Terminology - Finding a Node - Inserting a Node - Traversing the Tree - Finding Maximum and Minimum values - Deleting a Node - Efficiency of Binary Trees - Trees Represented as Arrays - Graphs: Introduction to Graphs - Searches - Minimum Spanning Tree - Topological Sorting with Directed Graphs - Connectivity in Directed Graphs. (Chapters : 3,4,5,7 (Only Quick Sort), 8,13)

Prescribed books:

1. E.Balaguruswamy, Programming with Java, A primer, 3e, TATA McGraw-Hill Company (2008).(Chapters : 1 to 14)

2. Robert Lafore, Data Structures & Algorithms in Java, Second Edition, Pearson Education(2008) (Chapters: 3,4,5,7 (Only Quick Sort),8,13)

Reference Books :

1. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, Tata McGrawhill (2007).

2. Timothy Budd, Understanding Object Oriented Programming with Java, Pearson Education (2007).

3. Adam Drozdek, Data Structures and Algorithms in Java, Second Edition, Cengage Learning(2008).

4. John R. Hubbard, Anita Hurry, Data Structures with Java, Pearson Education (2008).

5. Jana, Java and Object Oriented Programming Paradigm, PHI (2007).

6. Deitel & Deitel. Java TM: How to Program, 7th Edition, PHI (2008).

7. Samatha, Classic Data Structures, PHI (2005).

SECOND YEAR

PRACTICAL PAPER - II
JAVA AND DATA STRUCTURES LAB

Java Lab Cycle

1. Write a Java program to determine the sum of the following harmonic series for a given value of'n'. $1+1/2+1/3+. .. \_l/n$

2. Write a program to perform the following operations on strings through interactive input.

   a) Sort given strings in alphabetical order.
   b) Check whether one string is sub string of another string or not.
   c) Convert the strings to uppercase.

3. Write a program to simulate on-line shopping.

4. Write a program to identify a duplicate value in a vector.

5. Create two threads such that one of the thread print even no's and another prints odd no's up to a given range.

6. Define an exception called "Marks Out Of Bound" Exception, that is thrown if the entered marks are greater than 100.

7. Write a JAVA program to shuffle the list elements using all the possible permutations.

8. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operations. Also," write a program to use the package.

9. Write an Applet program to design a simple calculator.

10. Write a program to read a text and count all the occurrences of a given word. Also, display their positions.

11. Write an applet illustrating sequence of events in an applet.

12. Illustrate the method overriding in JAVA.

13. Write a piogram to fill elements into a list. Also, copy them in reverse order into another list.

14. Write an interactive program to accept name of a person and validate it. If the name contains any numeric value throw an exception "InvalidName".

15. Write an applet program to insert the text at the specified position.

16. Prompt for the cost price and selling price of an article and display the profit (or) loss percentage.

17. Create an anonymous array in JAVA.

18. Create a font animation application that changes the colors of text as and when prompted.

19. Write an interactive program to wish the user at different hours of the day.

20. Simulate the library information system i.e. maintain the list of books and borrower's details.

Data Structures Lab Cycle

21. Program to create, insert, delete and display operations on single linked list?

22. Program to create , insert, delete and display operations on double linked list ?

23. Program to create , insert, delete and display operations on circular single linked list ?

24. Program to split a single linked list
25. Program to reverse a single linked list
26. Program to implement Insertion Sort.
27. Program to implement PUSH and POP operations on Stack using array method.
28. Program to implement PUSH and POP operations on Stack using Linked list method.
29. Program to implement insert and delete operations on Queue using array method.
30. Program to implement insert and delete operations on Queue using linked list method.
31. Program to implement insert and delete operations on Priority Queue?
32. Program to implement insert and delete operations on Double Ended Queue?
33. Program to evaluate postfix expression by using Stack?
34. Program to construct Binary Search Tree and implement tree traversing Techniques.
35. Program to delete a leaf node from binary search tree.
36. Program to implement Selection Sort.
37. Program to implement Bubble Sort.
38. Program to implement Operations on Circular Queue.
39. Program to implement Quick Sort.
40. Program to Find number of Leaf nodes and Non-Leaf nodes in a Binary Search Tree.
41. Program for Insertion Sort.

THIRD YEAR

THEORY PAPER - III :
DATABASE MANAGEMENT SYSTEMS

UNIT-1

Database Systems: Introducing the database and DBMS, Why the database is important, Historical Roots: Files and File Systems, Problems with File System Data Management, Database Systems.

Data Models: The importance of Data models, Data Model Basic Building Blocks, Business Rules, The evaluation of Data Models, Degree of Data Abstraction.

The Relational Database Model: A logical view of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the system catalog, Relationships within the Relational Database, Data Redundancy revisited, Indexes, Codd's relational database rules. (Chapters -1: 1.2 to 1.6,2,3)

UNIT-2

Entity Relationship Model: The ER Model, Developing ER Diagram, Database Design Challenges: Conflicting Goals.

Advanced Data Modeling: The Extended Entity Relationship Model, Entity clustering, Entity integrity: Selecting Primary keys, Design Cases: Learning Flexible Database Design.

Normalization of database tables: Database Tables and Normalization, The need for Normalization, The Normalization Process, Improving the design, Surrogate Key Considerations, High level Normal Forms, Normalization and database design, denormalization. (Chapters: 4,6,5)

UNIT - 3

Introduction to SQL: Data Definition Commands, Data Manipulation Commands, Select queries, Advanced Data Definition Commands, Advanced Select queries, Virtual Tables, Joining Database Tables.

Advanced SQL: Relational Set Operators, SQL Join Operators, Subqueries and correlated queries, SQL Functions, Oracle Sequences, Updatable Views, and Procedural SQL.

Database Design: The Information System, The Systems Development Life Cycle, The Database Life Cycle, Database Design Strategies, Centralized Vs Decentralized design. (Chapters: 7,8(8.1 to 8.7),9)

UNIT - 4

Transaction Management and Concurrency Control: What is transaction, Concurrency control, Concurrency control with locking Methods, Concurrency control with time stamping methods, concurrency control with optimistic methods, database recovery management.

Distributed Database Management Systems: The evolution of Distributed Database Management Systems, DDBMS advantages and Disadvantages, Distribution Processing and Distribution Databases, Characteristics of Distributed database management systems, DDBMS Components, Levels of Data and Process distribution, Distributed database Transparency Features, Distributed Transparency, Transaction Transparency, Performance Transparency and Query Optimization, Distributed Database Design, Client Server Vs DDBMS. (Chapters: 10, 12)

UNIT - 5

The Data Warehouse: The need for data analysis, Decision support systems, The data warehouse, Online A nalytical Processing, Star schemas, Data mining, SQL extension for OLAP.

Database Administration: Data as a Corporate asset, The need for and role of databases in an organization, The evolution of the database administration function, The database environment's Human Component, Database administration Tools, The DBA at work: Using Oracle for Database Administration. (Chapter: 13:13.1 to 3.5,13.7,13.8,15:15.1,15.2,15.4,15.5,15.6,15.8)

Prescribed Text Book:

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)

Reference Books:

1. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley (2007).

2. Raman A Mata - Toledo/Panline K Cushman, Database Management Systems, Schaum's Outlibe series, Tata McGraw Hill (2007).

3. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, Eight Edition, Pearson Education (2006).

4. Michel Kifer, Arthur Bernstein, Philip M. Lewis, Prabin K. Pani Graphi, Database Systems: An application oriented Approach, seond edition, pearson education (2008).

5. Atul Kahate, Introduction to Database Management Systems, Pearson Education (2006).

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PAPER - 4.2 :

GUI PROGRAMMING

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Detailed Syllabus

UNIT-1

Getting Started with Visual Basic 6.0: Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, working with Forms, Developing an Application, Variables, Data types and Modules, Procedures and Control Structures, Arrays in Visual Basic

Working with Controls: Introduction, Creating and Using Controls, Working with Control Arrays.

Menus, Mouse Events and Dialog Boxes: Introduction, Mouse Events, Dialog Boxes. (Chapters:1,2,3)

UNIT - 2

Graphics, MDI and Felx Grid: Introduction, Graphics for application, Multiple Document Interface(MDI), Using FlexGrid Control.

Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Control, Using OLE Automation Objects, OLE Drag and Drop.

Objects and Classes: Introduction to Objects. Working with Objects, Classes and Class Modules.

Working with Add-Ins: Introduction to Add-Ins, Building Add-Ins. (Chapters: 4, 8, 9, 14)

UNIT - 3

File and File system Controls: Introduction, File System Controls, Accessing Files, Interface with Windows.

ODBC and Data Access Objects: Evolution of Computing Architectures, Data Access Options.

ODBC using Data Access Objects and Remote Data Objects: Open Database Connectivity, Remote Data Objects.

Working with ActiveX Data Objects: An overview of ADO and OLEDB, ADO object Model. (Chapters: 17,5,6,16)

UNIT - 4

Data Environment and Data Report: Introduction, Data Environment Designer, Data Report.

All about ActiveX Controls: Introduction, Constituents of ActiveX Control, Exposing AcrivX Control Properties.

ActiveX EXE and ActiveX DLL: Introduction to ActiveX EXE and ActiveX DLL, Creating and ActiveX EXE Component, Creating an ActiveX DLL Component. (Chapters: 7,10,11)

UNIT - 5

ActiveX Document Fundamentals: What is an ActiveX Document, Active Server Pages.

Built-in ActiveX Controls: Working with Built-in ActiveX Controls, Additional ActiveX Controls.

Introducing Web Browser and DHTML: Introduction, Internet Tools in Visual Basic, Using DHTML in Visual Basic. (Chapters: 12,13,15)

Prescribed Text Book:

1. Content Development Group, Visual Basic 6.0 Programming, Tata McGraw-Hill Publishing Company Limited (2007).

Reference Books :

1. Deitel and Deitel, Visual Basic 2005,
   Third Edition, Pearson Education (2007).
2. Noel Jerke, Visual Basic 6, The complete reference,
   Tata Mcgraw Hill (2006).
3. Byran S. Gottfried, Visual Basic, Schaum's outlines,
   Tata Mcgraw Hill (2004).