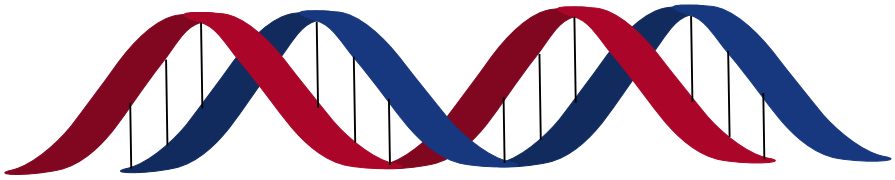
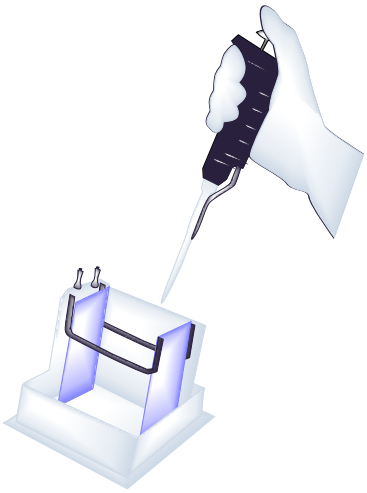
CERTIFICATE COURSE

In

"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"





DEPARTMENT OF CHEMISTRY

TARA GOVERNMENT COLLEGE, SANGAREDDY (A)

2021-22

INDEX

CERTIFICATE COURSE

In

"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

Department of Chemistry, Tara Government College, Sangareddy (A) has conducted **60** hours Certificate course in **Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis** for B.Sc. Final Year students for the skill development and Industry readiness. The Certificate course consist both Theoretical and Practical curricular segments with contemporary advances of Pharmaceutical Chemistry and Organic Synthesis which are the most essential attributes for acquiring the Jobs in the Pharma Sector which has colossal clutch on Industrial Stratum of the Sangareddy and nearby areas. Total **60** students of B.Sc. Chemistry-III year were trained and certified in this Certificate course in TWO (2) Batches. In **Batch-I**, 36 and in **Batch-II** 24 Students were trained.

Course Coordinator: Dr. Abhijit Kantankar, Head, Department of Chemistry

Faculty involved in the Course:

Name of the faculty	Topics Covered
Dr. Abhijit Kantankar	**Theory:** Chromatography, Spectroscopy & Medicinal Chemistry. **Laboratory Course:** Chromatography, Interpretation of Spectral Data, Software packages (ChemDraw and ChemSketch), HPLC-Virtual Demonstration & Organic Synthesis.
K.Sreedhar	**Theory:** Spectroscopy. **Laboratory Course:** Interpretation of Spectral Data.
Sweta Sagar	**Theory:** Medicinal Chemistry

CONTEXT OF THE COURSE:

India dominates the worldwide generic market. With little involvement in drug development, it is primarily monopolised by API manufacturers, intermediate suppliers, and CRAMS/CRO, etc. The majority of positions in the pharmaceutical business are in CRO/CRAMS, QA, and production. All of the individuals needed in these departments must be well-versed in analytical or instrumental chemistry or organic chemistry. They do better as a result. Pharma jobs can be found in plenty in Hyderabad. Why? The city has already established itself as India's pharmaceutical capital. In 2008–2009, it exported biopharmaceuticals worth US$3.1 billion. It is often referred to as "Genome Valley of India" and India's pharmaceutical capital due to the large number of pharmaceutical firms there. In the end, it promotes India and its economy. According to Medindia data, Hyderabad and its surrounding areas are home to more than 360 major and small pharmaceutical enterprises.

Foundation of Pharma Industry

The formation of Indian Drugs and Pharmaceuticals Limited (IDPL) in 1961 propelled the development of this metropolis to a new height. Later in 1990, the industry expanded with the establishment of:

1. **National Institute of Pharmaceutical Education and Research**
2. **Indian Institute of Chemical Technology**
3. **National Institute of Nutrition**
4. **The Centre for Cellular and Molecular Biology**

Additionally, the growth of its biotechnology and pharmaceutical industries was aided by other local institutions. Additional factors driving the expansion of the pharmaceutical business here include Genome Valley, Nano Technology Park, Fab City, and Public Sector Biotechnology Establishments. Better infrastructure was provided for this industry via cooperative existence. These elements drew numerous global corporations to establish R&D facilities, storage facilities, and manufacturing facilities. Hyderabad's retail sector has been at its height since 2007. The city is divided into various business areas. Four sectors make up Hyderabad's commercial market structure, including:

1. **The Central Business Districts (CBD)**
2. **The Sub-Central Business Centers**
3. **The Neighborhood Business Centers**
4. **Local Business Centers**

Hyderabad, Sangareddy and Surrounding Pharma Companies:

The following are a few of the city's largest pharmaceutical companies that are helping to make it a special area for job seekers who view the pharmaceutical industry as a lucrative industry:

Dr Reddy's Laboratories Ltd	**Aurobindo Pharma Ltd**	**Hetero Drugs**
Matrix Laboratories Limited	**Divis Laboratories Ltd**	**Celestial Biolabs Limited**
Granules India Ltd	**Natco Pharma Limited**	**Pochiraju Industries Ltd**
Novartis	**SMS Pharmaceuticals Ltd**	**Suven Life Sciences Limited**
A.S.V Laboratories (India) Pvt. Ltd	**Acto-Pharmaceuticals laboratories**	**AET Laboratories Pvt. Ltd.**
Ahmed & Company	**Akay Pharma Pvt. Ltd**	**Ceecure Pharma Pvt. Ltd**
Cheminor Drugs Ltd.	**Cheminova remedies Pvt. Ltd.**	**Chemtronik Enterprises**
Gladcare	**Gladwin Pharmaceuticals**	**Gland Pharma Ltd**

General Beneficiaries

Hyderabad's pharmaceutical business is growing for regional reasons, but we cannot discount the importance of India's general pharma sector growth. The Indian pharmaceutical business is anticipated to undergo significant changes and advances that will boost employment opportunities throughout the country's pharmaceutical industry, not just in Hyderabad. You can get a better idea of the potential for present and future growth from the following beneficiaries:

• It is anticipated that by 2016, 255 billion dollars' worth of patent pharmaceuticals will lose their exclusivity, greatly increasing the demand for generic products. It provides businesses with fantastic opportunity to grow.

• Due to the alleged surge in lifestyle diseases, Indian medicine sales figures may significantly increase.

• $200 billion will be spent on medical infrastructure over the next ten years.

• The market for over-the-counter drugs in India will grow to USD 6.6 billion by 2016.

• OTC drugs will be widely and easily accessible as a result of chemists' increased presence in India's rural areas.

• Pharma companies have raised their budgets in order to reach out to rural markets. They are creating a more effective infrastructure.

India's growing population is contributing to an increase in patients. A 20% increase will be noticeable.

• The acceptance of medications is rising as a result of improved education.

• Taking into account product patents, some MNCs are prepared to introduce patented medications in India.

• By 2020, the pharmaceutical business will generate 45 billion dollars in revenue.

The value of the pharmaceuticals market in India makes up roughly 2.4% of the total market.

• By volume, the pharmaceuticals sector in India makes up around 10% of the global pharma sector.

• The nation is anticipated to be among the top three pharmaceutical markets by 2022.

• India is the world's top exporter of generic drugs, accounting for 20% of all exports.

• India has a highly skilled labour force and supportive management.

• India is the sixth-largest market in the world by market size.

• India is on the road to prosperity. It will enable us to purchase generic medications off the shelf.

- Why The approval process for new settlements and facilities is no longer lengthy. Government is becoming more adaptable.

• If we compare it to the total production in Europe, it only requires half as much.

Major Pharma Industries in Sangareddy area:

Aurigene Discovery Technologies Limited
Address: Bollaram Road, Miyapur, Hyderabad -500 049.
Contact number: + 91 40 4465 7777
Type: Biotech Company

Dr. Reddy's Laboratories Limited
Address: API Hyderabad Plant 1, Plot No. 137 & 138 IDA Bollaram (V), Jinnaram(M), Sangareddy (Dist) 502325, Telangana.
Contact number: +91.8458.283 200
Type: Api plant

Dr. Reddy's Laboratories Limited
Address: API Hyderabad Plant 2, Chemical Technical operations, Unit – II,
Plot No. 1, 75A, 75B, 110, 111 & 112, Sri Venkateswara Co-operative Industrial Estate, Bollaram(V),
Jinnaram ((M)), Sangareddy (Dist)- 502 325, Telangana
Type: Api plant

Dr. Reddy's Laboratories Limited
Address: API Hyderabad 3, Plot No. 116, 116A & 126C & SY No. 157 IDA Bollaram (V), Jinnaram (M) Sangareddy (Dist) – 502 325, Telangana.
Contact number: +91.8458.283 700
Type: Api plant

Dr. Reddy's Laboratories Limited
Address: Formulations Hyderabad Plant 1, Plot No. 146,
IDA Bollaram(V), Jinnaram (M), Sangareddy (Dist) -502 320, Telangana.
Contact number: +91.8458.279 669
Type: Formulation plant

Gennex Laboratories Limited
Address :Survey No.133, IDA Bollaram(V), Jinnaram (M), Sangareddy (Dist)– 502 325, TG
Type: Api Plant

Hi-tech Pharmaceuticals
Address: 34-B,I.D.A Bollarum, Jinnaram(M), Sangareddy District,Telangana-502325.
Type: Contract Manufacturing Organisation (CMO)

Medreich Limited
Address: Manufacturing Unit V, #45 A & B,Anrich Industrial Estate,
Bollarum(V), Jinnaram(M), Sangareddy (Dist), Telangana 503325
Contact number: 08458 279289
Type: Contract Manufacturing Organisation

MSN Laboratories Pvt Ltd.
Address: Plot No- 42, Anrich Industrial Estate, Bollaram (V), Jinnaram (M), Sangareddy (Dist)-520 325,.
Contact number: +91-8458279936/937
Fax No- 91-8458-279938
Type: Formulation plant

MSN Laboratories Pvt Ltd.
Address: Plot No- 42, Anrich Industrial Estate, Bollaram (V), Jinnaram (M), Sangareddy (Dist)-520 325, Telangana.
Contact number: +91-8458279936/937,
Fax No- 91-8458-279938
Type: Formulation plant

Mylan Laboratories Limited
Address: Plot No. 34-A, ANRICH Industrial Estate, Bollaram(V), Jinnaram (M), Sangareddy(Dist)-502325, TG.
Contact number: + 91 – 40 –3049200 / 8458 – 279301
Type: "R & D & RA – (API & Finisher Dosage Formulation)
Type: Api plant &formulation

Prabhava Organics Pvt Ltd
Address: plot no.103/b, s.v. Co-operative industrial estate, bollarum(V), Jinnaram(M), sangareddy (Dist), TG.
Type: plant

Rampex Labs Pvt Ltd
Address: Plot No. 151, S.V. Co-Operative Indl, Estate Village Road, IDA Bollaram, Jinnaram(M), Sangareddy
(Dist), Telangana-502 325.
Contact number: +91 8458 279681 / 279682
Type: Api plant

Sai life sciences Ltd
Address: Unit-III, Survey No. 296/7/3 & 4, IDA Bollaram(V), Jinnaram (M), Sangareddy (Dist)-502325, TG
Type: Contract Research Organisation

SMS pharmaceuticals Limited
Address: Sy. No. 296/7/4, S.V. Co.op Ind. Estate I.D.A., Bollaram(V), Sangareddy (Dist) – 502 325, Telangana.
Contact number : + 91 – 040 – 64547975
Type: Plant

Sri Krishna Pharmaceuticals limited
Address: Unit IV, Survey no 296/7/10/, IDA, Bollaram(V), Jinnaram (M) 502 324, Sangareddy (Dist)-502319, Telangana.
Contact number: +91-8458 279296/8458320333.
Type: Api plant

Yeluri Pharmaceuticals Pvt Ltd
Address: SY NO: 296/7/6, IDA Bollarum, Jinnaram(M), Sangareddy (Dist), Telangana – 502325.
Type: CMO(Contract Manufacturing Organisation)

STRUCTURE OF THE CERTIFICATE COURSE

AIM OF THE COURSE

To impart the Concepts and Analytical techniques of Pharmaceutical chemistry and Organic Synthesis to students so that they can effectively absorbed in Pharmaceutical industries after completion of their graduation.

OBJECTIVES

1. To brush up the technical skills of students in organic synthesis and analytical chemistry to make them industry ready graduates in pharmaceutical companies.

2. To understand the real time challenges involved in organic synthesis.

3 To enable students to understand and interpret technicalities of organic synthesis using advance instrumentations.

4. Provide the basic knowledge of Medicinal chemistry.

5. Hands on experience on Chemical softwares.

6. To study the concepts of Medicinal Chemistry.

SYLLABUS

B. Sc. (Chemistry) III Year **Credits 05**

Sub : Chemistry

Course	**Certificate course**
Module (Unit)	**"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"**
Semester in which the course is to be taught	**Semester V/VI**
No. of credits	**05 (Theory-02, Practical-02 &Project-01)**
No. of Contact hours	**15 hrs/ week (Maximum)**

THEORY (30H)-02 CREDITS

Unit-I: Chromatography **10h**

Chromatography: Classification of chromatographic methods, principles of differential migration, adsorption phenomenon, nature of adsorbents, solvent systems.
Thin layer Chromatography (TLC): Advantages, preparation of plates, development of the chromatogram, Detection of the spots using UV cabinet, factors effecting R_f values and applications.
Column Chromatography- Principle, Types of stationary phases, Column packing – Wet packing technique, Dry packing technique. Selection criteria of mobile phase solvents for eluting polar, non-polar compounds and its applications.
High performance liquid chromatography: Theory and instrumentation, stationary phases and mobile phases. Methods of analysis of purity of compounds.

Unit -II: Spectroscopy-I: **10h**

a) ^{1}H NMR spectroscopy: Magnetic properties of nuclei, Principles of NMR, equivalent and non equivalent protons, Chemical shifts, factors affecting the chemical shifts, electro negativity and anisotropy, shielding and deshielding effects, Signal integration, Spin-spin coupling: vicinal, germinal and long range, Coupling constants and factors affecting coupling constants. Applications of ^{1}H NMR spectroscopy: Reaction mechanisms (cyclic bromonium ion, electrophilic and nucleophilic substitutions, carbocations and carbanions), E, Z isomers, conformation of cyclohexane and decalins, keto-enol tautomerism, hydrogen bonding, proton exchange processes (alcohols, amines and carboxylic acids), C-N rotation.

b) Mass spectrometry: Origin of mass spectrum, principles of EI mass spectrometer. Types of fragments: odd electron and even electron containing neutral and charged species (even electron rule), Nitrogen rule, isotopic peaks, determination of molecular formula, metastable ion peaks. High resolution mass spectrometry. Salient features of fragmentation pattern of organic compounds including β-cleavage, Mclafferty rearrangement, retro Diels – Alder fragmentation and ortho effect. Principle of EI, CI, Fast Atom Bombardment (FAB), Secondary Ion Mass Spectrometry (SIMS), Electrospray (ESI) ionization and Matrix Assisted Laser Desorption Ionization (MALDI) methods. Introduction to principle and applications of Gas Chromatography-Mass Spectrometry (GC-MS) and Liquid chromatography-Mass Spectrometry (LC-MS) techniques.

Unit -III: Medicinal Chemistry: **10h**

Basic terminology of medicinal chemistry, Types of disease, Drug nomenclature, classification of drugs, enzymes and bio-receptors, molecular messengers, synthesis of analgesic, antipyretic, antibacterial, antimalarial, anticancer, antidiabetic and antiviral drugs. Concepts of API and Bulk drug synthesis.

References:

1. Analytical Chemistry by David Krupadanam, Universities Press (India) Limited
2. D.A. Skoog, F.J. Holler, T.A. Nieman, Principles of Instrumental Analysis, Engage earningIndia Ed.
3. D. A. Skoog, D.M. West, F.J. Holler, Fundamentals of Analytical Chemistry 6thEd.,Saunders College Publishing, Fort worth (1992).
4. Willard, H.H., Merritt, L.L., Dean, J. &Settoe, F.A. Instrumental Methods of Analysis. 7thEd. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
5. Harris, D. C. Quantitative Chemical Analysis, W. H. Freeman.2007.
6. Dean, J. A. Analytical Chemistry Notebook, McGraw Hill.
7. Day, R. A. & Underwood, A. L. Quantitative Analysis, Prentice Hall of India.
8. Freifelder, D. Physical Biochemistry 2nd Ed., W.H. Freeman and Co., N.Y. USA, 1982.
9. Cooper, T.G. The Tools of Biochemistry, John Wiley and Sons, N.Y. USA. 16,1977.
10. Vogel, A. I. Vogel's Qualitative Inorganic Analysis 7th Ed., Prentice Hall.
11. Vogel, A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Prentice Hall.
12. Robinson, J.W. Undergraduate Instrumental Analysis 5th Ed., Marcel Dekker, Inc, NewYork (1995).
13. Analytical Chemistry 7thedition by Gary D. Christian (2004).
14. B. K. Sharma, Industrial Chemistry (including Chemical Engineering). Edn.(1997).
15. M.N Sastry, Separation Methods, Paperback (2004), Himalaya Publications.
16. Usharani Analytical Chemistry Paperback (2000) Narosa Publications.
17. Fundamentals of Molecular Spectroscopy, Banwell and McCash.
18. Introduction to Molecular Spectroscopy, G.M. Barrow.
19. Absorption Spectroscopy of Organic Compounds, J.R. Dyer.
20. Biochemistry: Hames and Hooper.
21. Introduction to Spectroscopy, Pavia Lampman Kriz.
22. Pharmaceutical analysis, Watson
23. NMR in Chemistry- A multinuclear introduction, William Kemp.
24. Organic Spectroscopy, William Kemp.
25. Spectroscopy of organic compounds, P.S. Kalsi.
26. Structural methods n Inorganic chemistry, E.A.V Ebsworth.
27. Organic Spectroscopy, LDS Yadav
28. Organic Spectroscopy, Y.R. Sharma
29. Molecular Spectroscopy – Arhuldas
30. Medicinal chemistry-Ashutosh Kar

LABORATORY COURSE (30H)-02 CREDITS

1. **Chromatography**

Thin layer chromatography: Determination of purity of a given sample, monitoring the progress of chemical reactions and column chromatographic separations, identification of unknown organic compounds by comparing the R_f values of known standards, and preparative TLC for separation of mixtures.
Separation / Purification by column chromatography: Separation of a isomeric mixtures using column chromatography with simultaneous monitoring of separation of compounds using TLC.

2. **Interpretation of spectral data**

Identification of unknown organic compounds by interpretation of IR, ^{1}H NMR, ^{13}C NMR and mass spectra.

3. **ChemDraw and ChemSketch**: Molecular structure drawing with 3D geometry, drawing of chemical reactions with mechanism, Chemical analysis.

4. **HPLC:** Demonstration of analysis of purity of organic compound by using HPLC (Virtual)

5. **Organic synthesis:** Basic synthetic reactions: Oxidation, Reduction, cyclization and condensation reactions. Total synthesis of chromone, coumarin and quinoline based natural products. Isolation of Natural products.

References:

1. Practical organic chemistry by Mann & Saunders
2. Text book of practical organic chemistry by Vogel
3. Chromatography: Principles and Instrumentation (Chemical Analysis
4. Practical chemistry by V.K Ahluwalia, Sunitha Dhingra, Adarsh Gulati.
5. Text book of practical organic chemistry by Vogel
6. The systematic identification of organic compounds by Shriner et.al
7. Analytical chemistry by G N David Krupadanam et.al
8. Advanced practical medicinal chemistry by Ashutoshkar
9. Pharmaceutical drug analysis by Ashutoshkar
10. Quantitative analysis of drugs in pharmaceutical formulations by P D Sethi
11. Practical pharmaceutical chemistry part-1 and part-2 by A H Beekett and J B Stenlake
12. Organic Spectroscopy by JagMohan.

Tara Government College, Sangareddy

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SCHEME OF EXAMINATION

Theory Examinations (External)	**:**	**30 Marks**
Theory Examinations (Internal)	**:**	**20 Marks**
Project	**:**	**20 Marks**
Practical Examinations	**:**	**30 Marks**

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Blue Print of Question paper

External Exam

7 ½ X 4 = 30

Answer any four of the following questions

1.

2.

3.

4.

5.

6.

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Blue Print of Question paper

Internal Assessment

1 X 20 = 20M

Choose the correct Answer (MCQ)

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

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Scheme of Practical Examination

1. Major Experiment	15 Marks
2. Minor Experiment	
A.	05 Marks
B.	05 Marks
3. Record	03 Marks
4. Viva-voce	02 Marks
TOTAL	**30 Marks**

TARA GOVERNMENT COLLEGE (AUTONOMOUS), SANGAREDDY-502001,
DEPARTMENT OF CHEMISTRY

"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

INTERNAL ASSESSMENT **Max Marks: 20**

Name : **Roll Number:** **Group:**

CHOOSE THE CORRECT ANSWER FROM GIVEN OPTIONS. **20x1=20 M**

1. **Which of the following drug used in treatment of Bacterial diseases?**
   a. Sulphanilamide
   b. Paracetamol
   c. Aspirin
   d. All of the above
2. **Which of the following drug has free amino functional group?**
   a. PABA
   b. Paracetamol
   c. Aspirin
   d. Chloroquin
3. **Which of the following drug has quinoline skeleton?**
   a. Chloroquin
   b. Aspirin
   c. Omeprazol
   d. Isoniazid
4. **Which of the following drug used in cancer treatment?.**
   a. Cisplatin
   b. Penicillin
   c. Aspirin
   d. None of the above
5. **The chemical name of Aspirin**
   a. Acetyl salicylic acid
   b. Para amino phenol
   c. Para actamido phenol
   d. Diamino phenol
6. **Drug used in_____.**
   e. Diagnosis of the diseases b. Cure of the diseases
   c. Prevention of the diseases d. All of the above
7. **Which of the following disease is air borne_____?**
   e. Malaria b. Typhoid c. Dysentery d. Influenza
8. **Which of the following is chemical name of Aspirin**
   e. Para amino phenol b. Para amino bnzoic acid
   c. Dinitro phenol d. Acetyl salicylic acid
9. **Acyclovir is a_____drug.**

a. Antibacterial b. Antiprotozoan c. Anticancer d. Antiviral

10. Which following drug is an anti-inflamatory

a. Clotrimazole b. Penicillin c. Dapsone d. Ibuprofen

11. The process of extraction of adsorbed components from the adsorbent with the help of solvent is called as_____.

f. Elution
g. Promulgation
h. Simulation
i. None of the above

12. Zeolites are usually used in _____chromatography.

f. Ion Exchange chromatography
g. HPLC
h. GSC
i. TLC

13. What is the mobile phase in GLC?.

e. Liquid b. Gas c. Solid d.Water

14. The most widely used detectors in Gas Chromatography?.

e. Thermal conductivity detector
f. Flame ionization detector
g. Electron capture detector
h. All of the above

15. The operating pressure in HPLC is_____.

f. 3000psi b. 300psi c. 30psi d.100psi

16. In HPLC sample injection system is equipped with _____.

a. Micro syringe
b. Micro pipette
c. Microscope
d. Micrometer

17. Determination of sodium and potassium from their salt mixture is done by _____.

j. HPLC
k. Ion Exchange chromatography
l. Paper chromatography
m. GLC

18. Which of the following factor affects the efficiency of Column chromatography?.

a. Quality of solvents
b. Temperature
c. Particle size of the column packing
d. All of the above

19. Which of the following chromatographic technique is the most accurate?.

a. HPLC b. TLC c. PC d.CC

20. Column chromatography is always incorporated with_____.

a. TLC b. HPLC c. GSC d. PC

Tara Government College, Sangareddy

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Affiliated to the Osmania University- Hyderabad

"Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

External Exam

ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS 7 ½ x 4 = 30

1. Explain the different Column packing Techniques of Column Chramatography.
2. Write the applications of HPLC in pharmaceutical chemistry.
3. How should you identify the reactions mechanism of Nucleophilic and Electrophilic Substitution reactions using ^{1}H-NMR Spectroscopy?.
4. Explain the Nitrogen Rule and Isotopic peaks in Mass Spectrometry.
5. Explain the Classification of Drugs.
6. Write the Synthesis and therapeutic activity of Paracetamol and sulphanilamide.

List of Project works Completed by the students in the Part of Certificate Course:

BATCH-II

Project	Name of the Student	Roll Number	Completed Project
I	A.Madappa	605019572001	STRUCTURAL ELUCIDATION OF ACETOPHENONE USING SPECTRAL DATA
	G.Sheshikanth	605019572005	
	B.Pavna Kumar	605019572003	
	SaiTeja	605019572010	
	Anil Kumar. K	605019572007	
	M.Nikhitha	605019572008	
II	Sai Prasanna	605019572006	STRUCTURAL ELUCIDATION OF ETHYL BENZOATE USING SPECTRAL DATA
	U.Navaneetha	605019572014	
	Meenakshi	605019572012	
	S.Laxman	605019572013	
	Vamshi.U	605019572015	
	Amrin	605019457001	
III	Sangeetha	605019457002	STRUCTURAL ELUCIDATION OF BENZYL ACETATE USING SPECTRAL DATA
	E.Shivaleela	605019457007	
	N.Ranjitha	605019457013	
	N.Anitha	605019457014	
	P.Prashanth Kumar	605019457018	
	P.Srija	605019457021	

Project	Name of the Student	Roll Number	Completed Project
IV	P.Madhavi	605019457022	**STRUCTURAL ELUCIDATION OF DI-ISOPROPYL ETHER USING SPECTRAL DATA**
	R.AbhishekaSumalatha	605019457023	
	S.Vyshnavi	605019457025	
	M.Ruchitha	605019457012	
	U.Kavyasri	605019457028	
	Uroojunnisa	605019457029	
V	V.Keerthana	605019457030	**STRUCTURAL ELUCIDATION OF PHENYL ACETATE USING SPECTRAL DATA**
	K.Mounika	605819445064	
	K.Namdev	605819445056	
	K.Prashanth Kumar	605819445055	
	B.Radhika	605819445019	
	B.Sukanya	605819445013	
VI	H.Vasantha	605819445047	**STRUCTURAL ELUCIDATION OF PHENYL ETHYL ETHER USING SPECTRAL DATA**
	U.Sai Bhargavi	605819445097	
	E.Srikanth	605819445037	
	M.Jagoor	605819445077	
	M.Maheshwari	605819445073	
	B.Pooja Rani	605819445021	

BATCH-II

Project	Name of the Student	Roll Number	Completed Project
VII	K.Narsihmulu	605819445054	STRUCTURAL ELUCIDATION OF ACETANILIDE USING SPECTRAL DATA
	H.Vishnu	605819445048	
	K.Vishnu	605819445065	
	E.Srilatha	605819441021	
	M.Shivakumar	605819441055	
	B.Jagadeeshwar	605819441016	
VIII	A.Nagaraju	605819441004	STRUCTURAL ELUCIDATION OF ACETOPHENONE USING SPECTRAL DATA
	M.Naveen	605819441056	
	G.Srivani	605819441027	
	M.Rohith	605819441049	
	P.Pavan	605819441069	
	G.Annapurna	605819441022	
IX	K.Subhash	605819441038	STRUCTURAL ELUCIDATION OF BUTANOIC ANHYDRIDE USING SPECTRAL DATA
	K.Saiteja Reddy	605819441042	
	L.Sharath	605819441045	
	J.Harshitha	605819441032	
	P.Srikanth	605819441062	
	A.Hanok	605819445002	

Project	Name of the Student	Roll Number	Completed Project
X	E.Karthik	605819441020	STRUCTURAL ELUCIDATION OF BENZYL BROMIDE USING SPECTRAL DATA
	P.Padma	605819445087	
	K.Goraknath	605819441043	
	R.Nikhitha	605819445092	
	K.Shalini	605819457009	
	M.Srinath	605819441057	

Photo Gallery:


By pass Road BSNL office line opp. tara degree college 2 Gate, Prashanth Nagar Colony, Ahmed Nagar, Sangareddy, Telangana 502001, India
District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG...
Masjid e Ameeri
Padmavathi multispeciality hospital
Ayyappa Temple
Google
Sangareddy
Telangana
India
2021-11-29(Mon) 11:39(AM)
23°C
73°F


By pass Road BSNL office line opp. tara degree college 2 Gate, Prashanth Nagar Colony, Ahmed Nagar, Sangareddy, Telangana 502001, India
District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG...
Govt ITI San
Shishuraksha Children's hospital
Ayyappa Temple
Google
Sangareddy
Telangana
India
2022-01-07(Fri) 12:40(PM)
24°C
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District Registrar Office Sangareddy
Shishuraksha Children's hospital
Govt ITI Sangareddy
Ayyappa Temple
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3, Sangareddy Bypass Rd, Ahmed Nagar, Sangareddy, Telangana 502001, India
Sangareddy
Telangana
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District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG
Shishuraksha Children's hospital
Ayyappa Temple
Google
By pass Road BSNL office line opp. tara degree college 2 Gate, Prashanth Nagar Colony, Ahmed Nagar, Sangareddy, Telangana 502001, India
Sangareddy
Telangana
India
2022-01-07(Fri) 12:40(PM)
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J34G+9V2, Prashanth Nagar Colony, Balaji Nagar, Ahmed Nagar, Sangareddy, Telangana 502001, India
Sangareddy
Telangana
India
2022-04-13(Wed) 10:52(AM)
32°C
90°F
District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG
Google


J34G+9V2, Prashanth Nagar Colony, Balaji Nagar, Ahmed Nagar, Sangareddy, Telangana 502001, India
Sangareddy
Telangana
India
2022-04-27(Wed) 10:46(AM)
35°C
95°F
District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG
REVENUE COLONY
Google


J32H+WHH, Sangareddy Bypass Rd, Revenue Colony, Sangareddy, Telangana 502001, India
Sangareddy
Telangana
India
2022-05-26(Thu) 11:46(AM)
33°C
91°F
Office Sangareddy
REVENUE COLONY
Mahila Pranganam
RAJAMPET
Google


J34G+9V2, Prashanth Nagar Colony, Balaji Nagar, Ahmed Nagar, Sangareddy, Telangana 502001, India
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District Registrar Office Sangareddy
TARA GOVERNMENT DEGREE & PG
REVENUE COLONY
Google

TARA GOVERNMENT COLLEGE

(Autonomous)

Sangareddy-502001

(Re-Accredited by NAAC 'B' Grade)(Affiliated to Osmania Universisty)

Certificate cum Memorandum of Grades

of Certificate Course in

"CONCEPTS AND ANALYTICAL TECHNIQUES IN PHARMACEUTICAL CHEMISTRY AND ORGANIC SYNTHESIS"

conducted by

DEPARTMENT OF CHEMISTRY

Name : *P.PRASHANTH KUMAR*

Roll Number : **6058-19-457-018**

Group : *B.Sc.(MZC)*

Year : **III** **Academic year: 2021-22**

COURSE	CREDITS	GRADE
THEORY	2	O
PRACTICAL	2	O
PROJECT WORK	1	O

RESULT: PASSED **SGPA: 10.00**

SGPA= Total number of credit points/Total number of credits

Details of Award of Grades:

Range of Marks (in %)	Grade	Grade point
85-100	O	10
70-84	A	9
60-69	B	8
55-59	C	7
50-54	D	6
40-49	E	5
Less than 50	F	0

Head **Controller of Examinations** **Principal**

Department of Chemistry

LIST OF REGISTERED STUDENTS

Certificate Course in "Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

DEPARTMENT OF CHEMISTRY
TARA GOVT. COLLEGE, SANGAREDDY(A)

STUDENT ENROLLMENT Batch -I

S.No.	Name	Group	Year	Roll Number	Signature
01	Mallappa	BtBC	III year	6058-19-572-001	
02	G. Shekhar	BtBC	III year	6058-19-572-005	
03	B. pavankumar	BtBC	III year	6058-19-572-003	Pavan
04	Saiteja	BtBC	III year	6058-19-572-010	Saiteja
05	Anilkumar. K	BtBC	III year	6058-19-572-007	
06	M. Nikitha	BtBC	III year	6058-19-572-008	M. Nikitha
07	Saiprasanna	BtBC	III year	6058-19-572-006	Saiprasanna
08	U. Navaneetha	BtBC	III year	6058-19-572-014	
09	Meenakshi	BtBC	III year	6058-19-572-012	
10	S. Laxman	BtBC	III year	6058-19-572-013	
11)	Vamshi k. O	BtBC	III year	6058-19-572-015	
12)	Amin	MZC	III year	6058-19-457-001	
13)	Sangeetha.	MZC	III year	6058-19-457-002	
14)	E. Shivaleela	MZC	III year	6058-19-457-007	E. Shivaleela
15)	N. Ranjitha	MZC	III year	6058-19-457-013	N. Ranjitha
16)	N. Anitha	MZC	III year	6058-19-457-014	N. Anitha
17)	P. Prashanth Kumar	MZC	III year	6058-19-457-018	P. Prashanth Kumar
18)	P. Srija	MZC	III year	6058-19-457-021	Srija
19)	P. Madhavi	MZC	III year	6058-19-457-022	P. Madhavi
20)	R. Abhisheka sumalatha	MZC	III year	6058-19-457-023	
21)	S. Vyshnavi	MZC	III year	6058-19-457-025	S. Vyshnavi

Certificate Course in "Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

DEPARTMENT OF CHEMISTRY
TARA GOVT. COLLEGE, SANGAREDDY(A)

STUDENT ENROLLMENT Batch-I

S.No.	Name	Group	Year	Roll Number	Signature
22)	M. Ruchitha.	MZC	III year	6058-19-457-012	Ruchitha
23)	U. Kavya Sri	MZC	III year	6058-19-457-028	Kavya Sri
24)	Uroojunnisa	MZC	III year	6058-19-457-029	Urooj
25)	V. Keerthana	MZC	III year	6058-19-457-030	Keerthana
26)	K. Mounika	BZC	III year	6058-19-445-064	K. Mounika.
27)	K. Nanda	BZC	III year	6058-19-445-056	K. Nanda
28)	K. Prashanth Kumar	BZC	III year	6058-19-445-058	[illegible]
29)	B. Radhika	BZC	III year	6058-19-445-019	B. Radhika
30)	B. Sukanya	BZC	III year	6058-19-445-013	B. Sukanya
31)	H. Vasantha	BZC	III year	6058-19-445-047	H. Vasantha
32)	U. Sai Bhargavi	BZC	III year	6058-19-445-097	U. Sai Bhargavi
33	E. Srikanth	BZC	III year	6058-19-445-037	E. Srikanth
34)	M. Jagoor	BZC	III year	6058-19-445-077	M. Jagoor
35)	M. Maheshwari	BZC	III year	6058-19-445-073	M. Maheshwari
36)	B. Pooja Rani	BZC	III year	6058-19-445-021	B. Pooja Rani

Certificate Course in "Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

DEPARTMENT OF CHEMISTRY
TARA GOVT. COLLEGE, SANGAREDDY(A)

STUDENT ENROLLMENT Batch-II

S.No.	Name	Group	Year	Roll Number	Signature
1	K. Narsimulu	BSC (BZC) E/M	III	6058-19-445-054	K. Narsimulu
2.	H. Vishnu	BSC (BZC) E/M	III	6058-19-445-048	H. Vishnu
3.	K. Vishnu	BSC [BZC] E/M	III	6058-19-445-065	K. Vishnu.
4.	E. Srilatha	BSC (MPC) E/M	III	6058-19-441-021	E. Srilatha
5	M Shiva kumar	BSC (MPC) E/M	III	6058-19-441-055	
6.	B. Jagadeeshwar	B.SC [MPC] E/M	III	6058-19-441-016	
7.	A. Nagaraju.	B.SC (MPC) E/M	III	6058-19-441-004	A. Nagaraju.
8	M. Naveen	BSC [MPC] E/M	III	6058-19-441-056	
9.	G. Sravani	BSC [MPC] E/M	III	6058-19-441-027	G. Sravani
10.	M. Rohith	BSC [MPC] E/M	III rd	6058-19-441-049	Rohith
11)	P. PAVAN	BSC (MPC) E/M	III 2nd	6058-19-441-069	
12)	G. Annapurna	BSC [MPC] E/M	III rd	6058-19-441-022	G. Annapurna
13)	K. Subhash	BSC [MPC] E/M	III rd	6058-19-441-058	
14)	K. Sai Teja Reddy	BSC (MPC) E/M	III rd	6058-19-441-042	K. Sai
15)	L. Sharath	BSC (MPC) E/M	III rd	6058-19-441-045	L.
16)	J. Harshitha	BSC [MPC] F/M	III rd	6058-19-441-032	J.
17)	P. Srikanth	BSC (MPC) E/M	III rd	6058-19-441-062	P.
18)	A. Hanok	BSC [B.Z.C] E/M	III rd	6058-19-445-002	A. Hanok.
19)	E. Karthik	BSC (MPC) E/M	III rd	6058-19-441-020	E. Karthik.
20)	P. Padma	BSC [B.ZC] E/M	III rd	6058-19-445-087	P. Padma
21)	K. Gorakanath	BSC (MPC) E/M	III rd	6058-19-441-043	K. Gorakanath

Certificate Course in "Concepts and Analytical techniques in Pharmaceutical chemistry and Organic Synthesis"

DEPARTMENT OF CHEMISTRY
TARA GOVT. COLLEGE, SANGAREDDY(A)

STUDENT ENROLLMENT Batch-II

S.No.	Name	Group	Year	Roll Number	Signature
22	R. Nikitha	B.Sc(BZC) E/M	IIIrd yr	605819495092	R. Nikitha
23	K Shalini	B.Sc[MZC]E/M	III	6058-19-457-009	K Shalini
24.	M. Srinath	B.Sc [MPC] E/M	III	6058-19-441-057	M. Srinath