

Code: 812/R/BL

**FACULTY OF SCIENCE**  
**B.Sc., V-Semester (Regular/Backlog) Examinations, December-2023**  
*(2019, 2020 & 2021 Batches)*  
**BIOTECHNOLOGY**  
**Paper-V(A)**  
**Plant Biotechnology**

Time: 3 hours

**Section-A (Short Answer Questions)**

Max Marks: 80

Note: Answer any **Eight** of the following questions in not exceeding 20 lines each.

8x4=32M

1. Explain the terms regeneration and totipotency. 4M
2. What is the role of gibberellins in plant tissue culture? 4M
3. Describe the cell suspension culture technique. 4M
4. What is meristem culture? What are advantages of meristem culture? 4M
5. Differentiate somatic hybrids and cybrids. 4M
6. What are the applications of cryopreservation in plant tissue culture? 4M
7. Give the features of Ti plasmid. 4M
8. Explain the principle of electroporation. 4M
9. Distinguish binary and co-integrate vectors. 4M
10. Give any two examples of drought tolerant transgenic crops. 4M
11. How are plants used in antibody production? 4M
12. Explain transgenic plants as edible vaccines. 4M

**Section-B (Essay Answer Questions)**

4x12=48M

Note: Answer the following questions in not exceeding 4 pages each.

13. a) Write an essay on different types of plant tissue culture media. 12M  

(OR)

b) Discuss the methods of sterilization used in plant tissue culture. 12M
14. a) Describe the principle, procedure and applications of pollen culture. 12M  

(OR)

b) Explain the principle, procedure and applications of protoplast culture. 12M
15. a) Write an account on chemical methods of gene transfer techniques used in production of transgenic plants. 12M  

(OR)

b) Discuss the use of viral vectors in plant genetic engineering. 12M
16. a) Write an essay on insect resistant transgenic plants. 12M  

(OR)

b) Discuss the transgenic based mechanism to develop salt tolerance in crop. 12M



Code: 457/E/YW/BL

FACULTY OF SCIENCE  
**B.Sc. III – Year (YW-Backlog) Examinations, October -2020**  
BIO-TECHNOLOGY  
Paper – IV  
(Applications of Bio-Technology)

Time : 3 Hours

Max. Marks: 100

**Note :** Answer **ALL** the questions. **ALL** Questions carry equal marks.

- 1.a) Explain the Microinjection mediated gene transfer in animals.  
**OR**  
b) Write a detailed account of stem cells and their application in biology.
- 2.a) Explain the commercial production of useful compounds from plant cell cultures.  
**OR**  
b) Explain the Microprojectile bombardment method of gene transfer.
- 3.a) Describe the bioreactor technology for the production of interferon from animal cells.  
**OR**  
b) Discuss the good laboratory practice and biosafety issues.
- 4.a) Explain the microbial treatment of municipal and industrial waste.  
**OR**  
b) Discuss the impact on non-conventional fuel such as bio-gas and bio-ethanol on the environment.
5. Write short notes on **any three** of the following:
  - a) Embryo transfer Technology
  - b) Plant growth regulators in plant tissue culture
  - c) Fermentation of Dairy products
  - d) Microbial Ore leaching
  - e) Bioreactors





Code: 433/E/YW/BL

**FACULTY OF SCIENCE**  
**B.Sc., II – Year (YW-Backlog) Examinations, Oct./Nov.-2020**  
**BIO-TECHNOLOGY**  
**Paper – II**  
**(Biological Chemistry and Microbiology)**

Time : 3 Hours

Max. Marks : 100

Note : Answer All questions.

- 1.a) Explain the structure and function of polysaccharides with reference to starch and Glycogen.

**OR**

- b) Discuss the various factors effecting the enzymatic reactions.

- 2.a) Describe the various reactions of Glycolysis.

**OR**

- b) Explain the detailed process of Photophosphorylation.

- 3.a) Describe the details of HIV pathogen and its symptoms.

**OR**

- b) Give an account of Structure and general characters of Viruses.

- 4.a) Explain the principle and applications of light Microscope.

**OR**

- b) Discuss the Radioisotope and their applications.

5. Write a short notes on any **Three** of the following:

- a) Peptide bond
- b) Phenylketonuria
- c) Micro Algae
- d) Colorimetry
- e) Cardiac Glycosides





Code: 422/E/YW/BL

**FACULTY OF SCIENCE**  
**B.Sc. I - Year (YW-Backlog) Examinations, Oct/Nov-2020**  
**BIO-TECHNOLOGY**  
**Paper – I**  
**(Cell Biology and Genetic)**

Time: 3 Hours

Max. Marks: 100

**Note:** Answer **All** the questions. All questions carry equal marks.

1. a) Describe the various stages in Meiosis cell division and mention its significance.  
**OR**  
b) Write a detailed account of ultra-structure of bacterial cell.
2. a) Discuss the Mendel's Law of independent assortment with Dihybrid cross.  
**OR**  
b) Explain the genic balance theory of sex determination.
3. a) Give an account of mechanism of DNA replication.  
**OR**  
b) Describe the Griffith experiment on DNA as a genetic material.
4. a) Discuss the various types of Probability distribution with reference to biological data.  
**OR**  
b) Explain the various types of biological databases and their utilization in Biotechnology.
5. Write a short note on any three of the following:
  - a) Mitochondria
  - b) Linkage and Crossing over
  - c) DNA damage and Repair
  - d) Regression and Correlation
  - e) Lamp Brush chromosomes





Code: 878/E/R

**FACULTY OF SCIENCE**  
**B.Sc., II-Semester (Regular) Examination, December-2020**  
**BIO-TECHNOLOGY -2**  
**(Biological Chemistry and Microbiology)**

Time: 2 Hours

Max. Marks: 80

**Note:** Answer any **Four** of the following questions.**4x20=80M**

1. What are Polysaccharides? Explain the Structure and Functions of Starch and Glycogen.
2. Define Enzyme inhibition. Elaborate on its types.
3. Describe Oxidative phosphorylation.
4. Discuss Beta oxidation of Fatty acids.
5. Elaborate on Classification of Microorganisms.
6. Explain the Pathogenesis and symptoms of Hepatitis.
7. What are Synchronous Cultures? Add a note on Measurement of Bacterial growth.
8. Describe the Culturing of Anaerobic bacteria.





Code: 761/E/BL

**FACULTY OF SCIENCE**  
**B.Sc., II-Semester (Backlog) Examinations, December-2020**  
**BIOTECHNOLOGY-2**  
**(Nucleic Acids & Bioinformatics)**

Time: 2 Hours

Max. Marks: 80

**Note:** Answer any **Four** of the following questions.**4x20=80M**

1. Write a note on the experiments carried out to prove DNA as genetic material.
2. What are kinetic classes of DNA? Describe each class of DNA with examples.
3. Define mutation. Illustrate different types of mutations with examples.
4. What is DNA repair? Explain DNA repair mechanisms with diagrams.
5. Define bioinformatics and discuss the role of internet in bioinformatics.
6. What is a database? How are they useful in biological research?
7. What is drug designing? How does bioinformatics assist in drug discovery pipeline?
8. What is phylogenetic analysis? Explain the role of multiple sequence alignment in phylogenetics.





Code: 607/E/R/BL

FACULTY OF SCIENCE  
B.Sc., I-Semester (Regular-Backlog) Examinations, February/March-2022  
BIOTECHNOLOGY  
Paper-I  
Cell Biology and Genetics

Time: 3 Hours

Max. Marks: 80

**Section - A (Short Answer Questions)**

8 x 4=32M

**Note:** Answer any **Eight** of the following questions not exceeding 20 lines each.

1. Vacuoles
2. Histones and non-histones
3. Cell cycle
4. Bacterial cell division
5. Incomplete dominance and co-dominance
6. Multiple alleles
7. Shell coiling in snail
8. Pky inheritance
9. Cell membrane permeability
10. Synaptonemal complex
11. X-Y chromosomes
12. Hardy-Weinberg equilibrium

**Section - B (Essay Answer Questions)**

4 x 12=48M

**Note:** Answer any **Four** of the following questions in not exceeding 4 pages each.

13. Describe the ultrastructure of cell wall and cell membrane.
14. Discuss with examples numerical aberrations of chromosomes.
15. With diagrams, discuss the chromosome segregation in mitosis.
16. Give an account on necrosis. Differentiate apoptosis and senescence.
17. Explain with help of example Law of Independent Assortment.
18. Discuss the factors for success of Mendelian experiments.
19. Give a detailed account on cytological proof of crossing over.
20. Explain organellar inheritance in *maize* and *Mirabilis Jalapa*.





Code: 948/E/R

FACULTY OF SCIENCE  
B.Sc., V-Semester (Regular) Examinations, February/March-2022  
BIOTECHNOLOGY  
Paper-V(A)  
Plant Biotechnology

Time: 3 Hours

Max. Marks: 80

## Section - A (Short Answer Questions)

8 x 4=32M

**Note:** Answer any **Eight** of the following questions not exceeding 20 lines each.

1. What is totipotency? Why are plant cells totipotents?
2. Write a brief note on selection and sterilization of plant explants.
3. How are callus cultures produced?
4. What are cybrids? What are their applications?
5. How are synthetic seeds produced and encapsulated?
6. Discuss the applications of cell suspension cultures.
7. Write a short account on gene gun method and its applications.
8. Distinguish binary and co-integrate vectors.
9. What is genome editing? Give a brief note on CRISPR/Cas9 tool.
10. What are edible vaccines? Give examples.
11. How are plants helpful in bioplastic production?
12. Explain the generation of herbicide resistance transgenic plants.

## Section - B (Essay Answer Question)

4 x 12=48M

**Note:** Answer any **Four** of the following questions in not exceeding 4 pages each.

13. Discuss the nutritional requirements in plant tissue culture media.
14. Give a detailed account on role of auxins, cytokinins and gibberellins in plant tissue culture.
15. Write an essay on protoplast isolation, culture and fusion.
16. What is somaclonal variation? Discuss the causes and applications of somaclonal variation.
17. Describe the molecular mechanism of agrobacterium mediated gene transfer in plant cells.
18. How can reporter and selection marker genes help in transgenic plants selection? Discuss.
19. Discuss the development of transgenic plants for enhancement of Vitamin A and amino acids.
20. Explain the need and development of insect resistant plants. Why Bt Cotton is a failure?

