BLDE (DEEMED TO BE UNIVERSITY)

May-2025

Master of Science in Microbiology/ Biotechnology

[Time: 3 Hours] [Max. Marks: 80]

I SEMESTER

PAPER – I (Bioanalytical Techniques)

QP CODE: 7611/7811

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Question (Any – 3) **10 X 3= 30 Marks**

1. Enumerate various methods for characterization of biological macromolecules. Discuss any one method in detail giving example.
2. Write an essay on human genome project.
3. What are different blotting techniques? Explain. Which dyes are used for visualization?
4. Describe radioactivity, nature of various particles emitted and applications. Why half-life is used as a parameter for radioactive elements?

Short Essays: (Any – 7) **5 X 7 = 35 Marks**

5. Discuss Beer -Lambert law giving the equation. Explain why monochromatic light is required.
6. Discuss in detail any one protein sequencing method taking a small peptide(ten amino acids) as an example
7. What is the principle of Gel permeation chromatography (GPC)? Give applications of GPC.
8. Discuss in detail SDS-PAGE technique. What is the role of SDS?
9. Explain Raman scattering and its applications.
10. Define Bragg's law of x-ray diffraction.
11. Explain the principle of NMR spectroscopy.
12. What is a LASER? Explain its design.

Short Answers: (Any – 5) **3 X 5 = 15 Marks**

13. Give principle of ESR spectroscopy.
14. Give any one reaction of bioluminescence
15. With diagram, explain photomultiplier principle used as detector.
16. Why measurements are conducted at perpendicular direction to the incident beam in fluorometry?
17. What are various hydrodynamic properties of biomolecules?
18. Discuss the principle of Con Focal microscopy.

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I SEMESTER

PAPER – II (Bioinorganic and Biomolecules)

QP CODE: 7612/7812

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Question (Any – 3) **10 X 3= 30 Marks**

1. What is Beta-Oxidation of Fatty Acids? Explain in detail the steps in Beta-Oxidation of Palmitic Acid. Add a note on energetics and Regulation of Beta Oxidation.
2. What is stereoisomerism, explain with a suitable example.
3. Write a note on Watson Crick's model of DNA.
4. What is thermodynamics? Explain the three laws of thermodynamics and drive an equation for each

Short Essays: (Any – 7) **5 X 7 = 35 Marks**

5. What are proteins? Write brief notes on proteins.
6. What are peptides and polypeptides? Explain with a suitable example.
7. Synthesis of glucose from Succinyl CoA.
8. What are carbohydrates? Give their classification based on their structure.
9. What are nucleotides? Write a brief about the biologically important nucleotides.
10. What are secondary bonds?Explain a suitable example.
11. Write a note on the structure and functions of cholesterol.
12. Write the structure and functions of starch.

Short Answers: (Any – 5) **3 X 5 = 15 Marks**

13. Brief note on characteristics of genetic code
14. Redox processes
15. Explain the electron transport chain.
16. Draw the cyclic structure of pyranose
17. Optical activity.
18. Standard free energy.

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I SEMESTER

PAPER – III (Cell biology and Genetics)

QP CODE: 7613/7813

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions (Any – 3) **10 X 3= 30 Marks**

1. Structure & Functions of Plasma Membrane
2. Cell Cycle and its Regulation
3. Karyotyping
4. Chromosomal theory of inheritance

Short Essays (Any – 7) **5 X 7 = 35 Marks**

5. Chloroplast
6. Law of Independent Assortment
7. Mutations
8. Cyclin Dependent Kinase
9. Lampbrush Chromosomes
10. Sex Influenced Dominance
11. Multiple Alleles
12. Ribosomes

Short Answers (Any – 5) **3 X 5 = 15 Marks**

13. G1 Phase
14. Types of Chromosomes
15. Patau Syndrome
16. Polytene Chromosomes
17. Growth Factors
18. Apoptosis

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I SEMESTER

PAPER – IV (Biostatistics, Bioinformatics)

QP CODE: 7614/7814

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Question (Any – 3) **10 X 3= 30 Marks**

1. Short note on Measures of central tendency
2. Explain Regression, it's type and applications
3. Explain in detail about types of biological database with examples
4. Explain multiple sequence alignment

Short Essays: (Any – 7) **5 X 7 = 35 Marks**

5. Write about sequence alignment
6. Write short easy on application of bioinformatics
7. Specialized databases
8. Application of statistics in research
9. Explain testing of Hypothesis
10. Explain Chi square test and its applications
11. Explain data representation
12. Write difference between global and local sequence alignment

Short Answers: (Any – 5) **3 X 5 = 15 Marks**

13. FASTA sequence
14. Write in short about protein structure
15. Central dogma of life
16. Sequence homology
17. Importance of phylogenetic analysis
18. Define three measures of dispersion with examples