

BLDE (DEEMED TO BE UNIVERSITY)
Master of Science in Microbiology & Biotechnology

[Time: 3 Hours]

[Max. Marks: 80]

II SEMESTER
PAPER – I (Molecular Biology)
QP CODE: 7621/7821

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. Describe the experimental proof for DNA as genetic material
2. Give a detailed account of prokaryotic transcription process
3. Write a detailed note on post translation modification
4. Discuss in detail the mechanism of RNAi with suitable examples

Short Essays: (Any – 7)

5 X 7 = 35 Marks

5. Explain briefly the positive and negative gene regulation
6. Give a brief account of DNA binding motifs of transcription factors
7. Write a short note on structure of tRNA
8. Discuss in brief the initiation of translation in prokaryotes
9. Explain in brief the Wobble hypothesis with examples
10. Write a brief note on pre mRNA splicing
11. Discuss briefly the enzymes and proteins of DNA replication
12. Explain briefly the mechanism of DNA replication prokaryotes

Short Answers: (Any – 5)

3 X 5 = 15 Marks

13. DNA polymerase I
14. Eukaryotic RNA Polymerases
15. Polyadenylation
16. Attenuation
17. DNA Methylation
18. Promoters in prokaryotes

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II SEMESTER

PAPER – II (Immunology & Microbiology)

QP CODE: 7622/7822

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. Explain the history and significance of immunology. Describe the major components and functions of the immune system.
2. Describe the principles, procedures, and applications of immunoelectrophoresis, and single radial immunodiffusion techniques.
3. Explain the physical and chemical methods of sterilization, including their principles, procedures, and applications.
4. Compare the structure of prokaryotic and eukaryotic microorganisms with suitable examples.

Short Essays: (Any – 7)

5 X 7 = 35 Marks

5. Differentiate between innate immunity and adaptive immunity.
6. Describe the types of Blood groups with examples.
7. Explain self and non-self-recognition and differentiate between antigenicity and immunogenicity.
8. Explain the major milestones in the history of microbiology and mention the contributions of Louis Pasteur and Robert Koch.
9. Explain the composition, types, and preparation of culture media.
10. Write a note on capsule staining and endospore staining.
11. Explain the effect of temperature and pH on microbial growth.
12. Explain the structure, classification, and replication of viruses.

Short Answers: (Any – 5)

3 X 5 = 15 Marks

13. What are primary and secondary lymphoid organs? Give examples.
14. Define MALT.
15. What are epitopes and paratopes?
16. Define microbiology and mention any two applications of microbiology.
17. What is staining? Mention two purposes of staining microorganisms.
18. Define viroids and prions.

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II SEMESTER
PAPER – III (Genetic Engineering)
QP CODE: 7623/7823

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. Give an account on Ti and Ri plasmid vector constructs.
2. Describe the process of genomic DNA library construction and mention the screening techniques.
3. Discuss the process of competent cell preparation using bacteria and emphasise on the transfection techniques.
4. Give a detailed account on chemical synthesis of complete gene by phosphotriester and phosphite ester approaches.

Short Essays: (Any – 7)

5 X 7 = 35 Marks

5. Elaborate the mechanism of action of lambda exonuclease and exonuclease III
6. Describe the process of cDNA synthesis
7. Describe the process of plasmid DNA isolation.
8. Give an account on enzymatic method of DNA sequencing
9. Discuss the colony hybridization technique
10. Give an account on PAGE
11. Discuss the biochemistry of ribozyme
12. Elaborate the molecular mechanism of Agrobacterium mediated transformation

Short Answers: (Any – 5)

3 X 5 = 15 Marks

13. Fosmids
14. Non -conjugative plasmids
15. PCR
16. Western Blotting
17. Chloroplast transformation
18. Gene therapy

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II SEMESTER
PAPER – IV (Research Methodology)
QP CODE: 7624/7824

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. Define Sample. Explain various probability and non-probability methods of sampling with suitable examples.
2. Discuss fraud in medical research and measures to prevent it.
3. What is literature review? What is its importance in research methodology? Explain various sources of literature search?
4. Describe the different types of research, clearly pointing out the difference between an experiment and a survey.

Short Essays: (Any – 7)

5 X 7 = 35 Marks

5. What do you mean by research? Explain its significance in modern times.
6. What is impact of internet on biomedical research?
7. Role of referee in scientific publication.
8. What are various types of experimental designs?
9. How are research objectives different from research questions?
10. Explain differences in questionnaire and schedule.
11. Factor affecting internal and external validity
12. Criteria in selecting a research problem

Short Answers: (Any – 5)

3 X 5 = 15 Marks

13. What is informed consent?
14. What do you mean by Aim and Objectives?
15. What is prevalence?
16. What do you mean by population in research?
17. What is motivation in research?
18. What is a research hypothesis, and how is it formulated?