

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2025 (NEW COURSE)
Molecular Biology and Bio-Engineering(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que. 1 (A) Objective type questions. (04)
- 1) Who is considered the father of genetics?
 - 2) What organism did Morgan use in his classical experiments?
 - 3) Name one replication model of DNA.
 - 4) Which molecule is considered the universal genetic material?
- Que. 1 (B) Answer in Brief. (any one out of two) (03)
- 1) DNA as the universal genetic material
 - 2) Explain the structure of a gene with a neat labelled diagram.
- Que. 1 (C) Write a Note on (any one out of two). (07)
- 1) DNA replication in bacteria.
 - 2) Describe any one of the Morgan's experiments.
- Que. 2 (A) Objective type questions. (04)
- 1) What is the start codon in genetic code?
 - 2) State the role of ribosomes.
 - 3) State the role of initiation factor.
 - 4) What is post transcriptional modification?
- Que. 2 (B) Answer in Brief. (any one out of two) (03)
- 1) Write in short on structure of ribosome.
 - 2) Translation process.
- Que. 2 (C) Write a Note on. (any one out of two) (07)
- 1) Explain in detail: Arabinose operon.
 - 2) A detailed note on transcription.
- Que. 3 (A) Objective type questions. (04)
- 1) Define recombination.
 - 2) What are jumping genes?
 - 3) What are competent cells?
 - 4) What is abortive transduction?
- Que. 3 (B) Answer in Brief. (any one out of two) (03)
- 1) What is transformation?
 - 2) Explain – Homologous recombination.
- Que. 3 (C) Write a Note on. (any one out of two) (07)
- 1) Write in detail about conjugation.
 - 2) Generalized transduction – explain in detail.
- Que. 4 (A) Objective type questions. (04)
- 1) What is photo reactivation?
 - 2) Define phenotypic lag.
 - 3) Write any two examples of chemical mutagen.
 - 4) Which test is used for mutagenicity detection?

- Que. 4 (B) Answer in Brief. (any one out of two). (03)
- 1) Briefly explain the phenotypic effects of mutagens.
 - 2) Explain Excision repair mechanism.
- Que. 4 (C) Write a Note on. (any one out of two) (07)
- 1) Explain different types of mutation.
 - 2) Elaborate on Ames's test.
- Que. 5 (A) Objective type questions. (04)
- 1) Write the role of DNA ligase.
 - 2) State two characteristics of T_i plasmid.
 - 3) Importance of adapters.
 - 4) Enlist two characteristics of pBR 322.
- Que. 5 (B) Answer in Brief. (any one out of two) (03)
- 1) Write the difference between Genomic library and C-DNA library.
 - 2) Write the steps of RNA isolation.
- Que. 5 (C) Write a Note on. (any one out of two) (07)
- 1) Elaborate on Blue-white colony screening.
 - 2) Write salient features of ideal vector.
