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**BRAINWARE UNIVERSITY****Term End Examination 2025-2026****Programme – B.Tech.(BT)-2024****Course Name – Introduction to Biotechnology****Course Code - BTB30101****( Semester III )**

LIBRARY  
Brainware University  
Barasat, Kolkata -700125

**Full Marks : 60****Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

**Group-A**

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Which of the following is a eukaryotic organism?
  - a) E.coli
  - b) Bacteriophage
  - c) Saccharomyces cerevisiae
  - d) Streptococcus
- (ii) What happens to enzyme activity at very high temperature?
  - a) Increases indefinitely
  - b) Decreases due to denaturation
  - c) Remains same
  - d) Stops substrate binding
- (iii) Name the bond joining nucleotides in DNA.
  - a) Glycosidic bond
  - b) Phosphodiester bond
  - c) Peptide bond
  - d) Disulfide bond
- (iv) Name the infectious agent composed only of protein.
  - a) Virus
  - b) Viroid
  - c) Prion
  - d) Bacterium
- (v) Which theory of evolution proposed use and disuse of organs?
  - a) Darwinism
  - b) Mutation theory
  - c) Lamarckism
  - d) Neutral theory
- (vi) Which process converts ammonia to nitrate?
  - a) Ammonification
  - b) Nitrification
  - c) Denitrification
  - d) Fixation
- (vii) Which nuclear component synthesizes ribosomal RNA?
  - a) Nucleolus
  - b) Nuclear pore
  - c) Nuclear lamina
  - d) Chromatin
- (viii) Define linkage in genetics.
  - a) Independent assortment
  - b) Genes on different chromosomes

- c) Genes on same chromosome inherited together      d) Random mutation
- (ix) Identify Mendel's law describing the inheritance of two traits independently.  
 a) Law of segregation      b) Law of dominance  
 c) Law of linkage      d) Law of independent assortment
- (x) Name the method to introduce foreign DNA into bacterial cells.  
 a) Transduction      b) Transformation  
 c) Transfection      d) Conjugation
- (xi) Which database stores protein sequences?  
 a) GenBank      b) PDB  
 c) ENSEMBL      d) NCBI GEO
- (xii) What is the role of Taq polymerase in PCR?  
 a) Denatures DNA      b) Extends primers  
 c) Joins DNA fragments      d) Cuts DNA
- (xiii) State the purpose of Golden Rice.  
 a) Increased protein      b) Herbicide resistance  
 c) Vitamin A enrichment      d) Cold tolerance
- (xiv) What is the role of biotechnology in chemical industry?  
 a) Pesticide spraying      b) Bioreactor development  
 c) Antibiotic discovery      d) Enzyme-based synthesis
- (xv) State one ethical concern about cloning.  
 a) Increased biodiversity      b) Loss of genetic diversity  
 c) Improved traits only      d) Faster breeding

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. List two differences between DNA and RNA. (3)
3. Define cofactors with an example. (3)
4. Name the genetic material found in viruses. (3)
5. Define nucleolus and state its function. (3)
6. Justify use of monoclonal antibodies in healthcare. (3)

OR

Assess how probiotics benefit the food industry. (3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the structure, classification and functions of carbohydrates. (5)
8. Explain microbial growth phases in batch culture. (5)
9. Illustrate the stages of mitosis and describe changes at each stage. (5)
10. Analyze how biotechnology helps reduce environmental pollution. (5)
11. Formulate a plan to implement bioethics in a biotech research lab. (5)
12. Compare genome sequencing projects of humans and model organisms. (5)

OR

Evaluate the role of bioinformatics in modern biotechnology research. (5)

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