

**B.Sc. BIOTECHNOLOGY**  
**Fourth Semester**  
**Molecular Biology**  
**(BBT-16)**

**Duration: 3Hrs.**

**Full Marks: 70**

PART A (OBJECTIVE)=20  
PART B (DESCRIPTIVE)=50

**PART-B (Descriptive)**

**Duration: 2 hrs. 40 mins.**

**Marks: 50**

**I. Write short notes on (any five):**

**2×5=10**

- a) DNA super coiling
- b) Wobble hypothesis
- c) Genomics
- d) Nucleotide
- e) DNA denaturation
- f) Codon
- g) Repressor

**II. Explain in short (any five):**

**3×5=15**

- a) t-RNA structure
- b) SOS repair
- c) Activation of amino acid
- d) What is genetic code? Why genetic code is considered as degenerate? 2+1
- e) What do you mean by transposons? Give some examples of prokaryotic transposons. 2+1

f) Explain the process of gene regulation for Lactose metabolism in *E.coli*.

g) What is cot curve? What is its significance?

**III. Answer the following questions (any five):**

**5×5=25**

a) What is replication? Describe the mechanism by citing function of the each enzyme involved in the process. 5

b) Describe in brief the process of transcription termination in prokaryotes. 5

c) What is DNA repair? Describe the base excision process in detail. 1+4

d) What is translation process? Describe the function of releasing factor in translation process. 4+1=5

e) Describe the site directed recombination process 5

f) Describe in brief about the post translational modification methods. 5

g) Explain the B form of DNA structure. 5

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**Duration: 20 minutes**

**Marks – 20**

**PART- A (Objective)**

**Time: 20 mins**

**Total Marks: 20**

**I. Choose the correct answer from the following:**

**1×20=20**

1. The main source of nitrogen is
  - a) Sugar
  - b) Lipid
  - c) Amino acids
  - d) Amino acids and nucleotides
  
2. Nucleotide is made up of
  - a) Nitrogen base and sugar
  - b) Nitrogen base, sugar and phosphate
  - c) Nitrogen base and phosphate
  - d) Phosphate and sugar
  
3. DNA helix is
  - a) Complementary and antiparallel
  - b) Complementary and parallel
  - c) Non complementary and antiparallel
  - d) All of the above
  
4. Renaturation involves
  - a) Hydrogen bond formation
  - b) Hydrogen bond cleavage
  - c) Hydrogen bond is not involved
  - d) Phosphodiester bond formation

5. Emergency repair is
  - a) Base excision
  - b) Nucleotide excision
  - c) SOS response
  - d) All of the above
  
6. The jumping genes are
  - a) Transposons
  - b) Introns
  - c) Exons
  - d) Satellite genes
  
7. Recombination at a particular site is
  - a) Homologous
  - b) Site directed
  - c) Both
  - d) None
  
8. LINE and SHINE are found in
  - a) Eukaryotes
  - b) Prokaryotes
  - c) Both
  - d) Only in bacteria
  
9. Transcription initiation need
  - a) DNA polymerase
  - b) RNA exonuclease
  - c) DNA exonuclease
  - d) RNA polymerase
  
10. At the end of the transcription, the product formed is
  - a) Primary transcript
  - b) Secondary transcript
  - c) Tertiary transcript
  - d) Quaternary transcript
  
11. In DNA replication the template strand is
  - a) Single
  - b) Both strands
  - c) Not fixed
  - d) Depends upon the environmental conditions

12. Ligase is required for
- a) Joining okazaki fragments
  - b) Joining enzyme and promoter
  - b) Joining okazaki fragment and enzyme
  - d) Joining okazaki fragments and enhancer
13. Function of regulator gene is to synthesize
- a) Structural proteins
  - b) Inducer proteins
  - c) Repressor proteins
  - d) Structural and inducer proteins
14. Trp operon has .....structural genes
- a) 1
  - b) 2
  - c) 4
  - d) 5
15. The repressor formed from trp regulator gene is
- a) Apo repressor
  - b) Functional repressor
  - c) Active repressor
  - d) All of the above
16. Transcription termination need
- a) Rho factor
  - b) Sigma factor
  - c) Phi factor
  - d) Psi factor
17. Wobble hypothesis states that genetic code is
- a) Universal
  - b) Triplet
  - c) Codon rich
  - d) Degenerate
18. eEF is required for translation
- a) Termination
  - b) Activation of amino acid
  - c) Elongation
  - d) Initiation
19. Study of the entire genome structure and function is
- a) Proteomics
  - b) Genomics
  - c) Proteomics and Genomics
  - d) Genomics and transcriptomics
20. Post translational modification is required after the synthesis of
- a) Amino acid
  - b) RNA
  - c) DNA
  - d) Protein

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