

**B.Sc. ZOOLOGY
FIFTH SEMESTER
MOLECULAR BIOLOGY
BSZ-501**

**SET
B**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

(Objective)

Time: 30 mins.

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- In protein synthesis, translocation is initiated with the movement of:
 - tRNA from P-site to the A-site
 - dipeptidyl tRNA from A-site to P-site
 - tRNA from A-site to P-site
 - tRNA from P-site to E-site
- Name the protein, which is responsible for the formation of RNA primer?
 - Topoisomerase
 - Gyrase
 - Helicase
 - Primase
- Semi-conservative DNA replication was first demonstrated in:
 - Drosophila melanogaster*
 - Escherichia coli*
 - Streptococcus pneumoniae*
 - Drosophila melanogaster*
- Which of the following reactions is required for proofreading during DNA replication by DNA polymerase III?
 - 5' to 3' exonuclease activity
 - 3' to 5' exonuclease activity
 - 3' to 5' endonuclease activity
 - 5' to 3' endonuclease activity
- Which of the following is true about DNA polymerase?
 - It can synthesize DNA in the 5' to 3' direction
 - It can synthesize DNA in the 3' to 5' direction
 - It can synthesize mRNA in the 3' to 5' direction
 - It can synthesize mRNA in the 5' to 3' direction
- The enzyme used to join bits of DNA is:
 - DNA polymerase
 - DNA ligase
 - Endonuclease
 - Primase
- Name the protein, which is used for termination of replication.
 - DnaC
 - SSB
 - Tus protein
 - DNA polymerase
- In the case of a circular DNA synthesis how many replication forks are observed?
 - 1
 - 2
 - 3
 - 4
- DNA helicase travels along.....
 - Leading strand template in 3'→5' direction
 - Leading strand template in 5'→3' direction
 - Lagging strand template in 3'→5' direction
 - Lagging strand template in 5'→3' direction

10. A nucleotide is formed of which of the following units?
- Nitrogen base and phosphate
 - Nitrogen base, sugar and phosphate
 - Nitrogen base and sugar
 - Sugar and phosphate
11. Pribnow box in prokaryotes is positioned at:
- 10 bases
 - +10 bases
 - 40 bases
 - 35 bases
12. RNA having catalytic activity is called:
- Ribozyme
 - Ribosome
 - Holoenzyme
 - None of the above
13. An aminoacyl tRNA synthetase is responsible for:
- Formation of a peptide bond
 - Binding of mRNA to ribosomes
 - Attaching an amino acid to organic acid
 - Joining an amino acid to tRNA
14. Genetic code translates the language of:
- Amino acids into that of protein
 - DNA into that of proteins
 - RNA into that of proteins
 - RNA into that of DNA
15. Introduction of DNA molecules into the recipient organism is termed as.....
- Transformation
 - Translation
 - Transduction
 - Transcription
16. Which was a conclusion of Griffiths work with *Streptococcus pneumoniae*?
- DNA was the genetic material in the viruses
 - RNA was the genetic material in the viruses
 - Bacteria exposed to DNA can incorporate the DNA and change phenotype
 - None of the above
17. One end of tRNA matches genetic code in three-nucleotide sequences known as:
- Codon
 - Genetic code
 - Blunt ends
 - Anticodon
18. The molecule now known as DNA was first identified in the 1860s by a Swiss chemist:
- Johann Friedrich Miescher
 - Watson and Crick
 - H.G. Khorana
 - None of the above
19. What is Molecular Biology?
- Deals with the physical structures and processes of biological events
 - Deals with the chemical structures and processes of chemical events
 - Deals with the physical structures and processes of chemical events
 - Deals with the chemical structures and processes of biological events
20. RNA is the genetic material:
- In viruses and some prokaryotes
 - Only in some viruses
 - In all prokaryotes
 - In all viruses

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

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| 1. What are promoters? What is the role of sigma factor in transcription? Differentiate between rho dependent and rho independent transcription in prokaryotes with diagram. | 2+2+6=10 |
| 2. Describe Hershey and Chase experiment on DNA. In the Griffith experiment, why did mice die when injected with live R bacteria plus heat killed S bacteria? | 7+3=10 |
| 3. What is genetic code? Write its salient features. What does Wobble hypothesis signifies? | 1+5+4=10 |
| 4. Give a brief account on the scope of molecular biology. Describe the structure of tRNA and its role in protein synthesis. | 3+7=10 |
| 5. Draw a labeled diagram of polynucleotide chain of DNA. Differentiate between A, B and Z DNA. | 5+5=10 |
| 6. What is Translation? Explain the mechanism of translation in prokaryotes with proper illustration. | 2+8=10 |
| 7. What are Okazaki fragments? Describe with illustration, the mechanism of replication in both leading and lagging strand. | 2+8=10 |
| 8. What do you mean by semiconservative model of DNA replication? Explain the Meselson-Stahl experiment to demonstrate semiconservative model of DNA replication. | 3+7=10 |

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