REV-01
BSZ/02/07

2024/07

SET A

B.Sc. ZOOLOGY
FIFTH SEMESTER [SPECIAL REPEAT]
MOLECULAR BIOLOGY
BSZ-501
[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***

1. Pribnow box in prokaryotes is positioned at:
   a. -10 bases b. +10 bases
   c. 40 bases d. -35 bases
2. RNA having catalytic activity is called:
   a. Ribozyme b. Ribosome
   c. Holoenzyme d. None of the above
3. An aminoacyl tRNA synthetase is responsible for:
   a. Formation of a peptide bond b. Binding of mRNA to ribosomes
   c. Attaching an amino acid to organic acid d. Joining an amino acid to t RNA
4. Genetic code translates the language of:
   a. Amino acids into that of protein b. DNA into that of proteins
   c. RNA into that of proteins d. RNA into that of DNA
5. Introduction of DNA molecules into the recipient organism is termed as.....
   a. Transformation b. Translation
   c. Transduction d. Transcription
6. Which was a conclusion of Griffiths work with *Streptococcus pneumonia*?
   a. DNA was the genetic material in the viruses b. RNA was the genetic material in the viruses
   c. Bacteria exposed to DNA can incorporate the DNA and change phenotype d. None of the above
7. One end of tRNA matches genetic code in three-nucleotide sequences known as:
   a. Codon b. Genetic code
   c. Blunt ends d. Anticodon
8. The molecule now known as DNA was first identified in the 1860s by a Swiss chemist:
   a. Johann Friedrich Miescher b. Watson and Crick
   c. H.G. Khorana d. None of the above
9. What is Molecular Biology?
   a. Deals with the physical structures and processes of biological events b. Deals with the chemical structures and processes of chemical events
   c. Deals with the physical structures and processes of chemical events d. Deals with the chemical structures and processes of biological events

10. RNA is the genetic material:
    a. In viruses and some prokaryotes
    b. Only in some viruses
    c. In all prokaryotes
    d. In all viruses

11. In protein synthesis, translocation is initiated with the movement of:
    a. tRNA from P-site to the A-site
    b. dipeptidyl tRNA from A-site to P-site
    c. tRNA from A-site to P-site
    d. tRNA from P-site to E-site

12. Name the protein, which is responsible for the formation of RNA primer?
    a. Topoisomerase
    b. Gyrase
    c. Helicase
    d. Primase

13. Semi-conservative DNA replication was first demonstrated in:
    a. *Drosophila melanogaster*
    b. *Escherichia coli*
    c. *Streptococcus pneumoniae*
    d. *Drosophila melanogaster*

14. Which of the following reactions is required for proofreading during DNA replication by DNA polymerase III?
    a. 5′ to 3′ exonuclease activity
    b. 3′ to 5′ exonuclease activity
    c. 3′ to 5′ endonuclease activity
    d. 5′ to 3′ endonuclease activity

15. Which of the following is true about DNA polymerase?
    a. It can synthesize DNA in the 5′ to 3′ direction
    b. It can synthesize DNA in the 3′ to 5′ direction
    c. It can synthesize mRNA in the 3′ to 5′ direction
    d. It can synthesize mRNA in the 5′ to 3′ direction

16. The enzyme used to join bits of DNA is:
    a. DNA polymerase
    b. DNA ligase
    c. Endonuclease
    d. Primase

17. Name the protein, which is used for termination of replication.
    a. DnaC
    b. SSB
    c. Tus protein
    d. DNA polymerase

18. In the case of a circular DNA synthesis how many replication forks are observed?
    a. 1
    b. 2
    c. 3
    d. 4

19. DNA helicase travels along.....
    a. Leading strand template in 3′→5′ direction
    b. Leading strand template in 5′→3′ direction
    c. Lagging strand template in 3′→5′ direction
    d. Lagging strand template in 5′→3′ direction

20. A nucleotide is formed of which of the following units?
    a. Nitrogen base and phosphate
    b. Nitrogen base, sugar and phosphate
    c. Nitrogen base and sugar
    d. Sugar and phosphate

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

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

1. What is Translation? Explain the mechanism of translation in prokaryotes with proper illustration. 2+8=10
2. 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
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 t RNA 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. Describe Harshey 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
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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