REV-01 2022/08
BSZ/04/09

B.Sc. ZOOLOGY
FIFTH SEMESTER (SPECIAL REPEAT)
MOLECULAR BIOLOGY
BSZ-501

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs. **Full Marks : 70**

(PART-A : Objective)

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: ***1X20=20***

1. The Pribnow box is situated..... bases from the starting point of transcription.
   a. + 10 b. -10
   c. +35 d. -35
2. During the post transcriptional modification, the 5'- end of m RNA is capped with:
   a. 7 methylguanisine b. 7 methyladenosine
   c. 5 methylguanosine d. 5 methyladenosine
3. The two subunits of 70 s ribosome in prokaryote are:
   a. 30 S and 40 S b. 60 S and 40 S
   c. 30 S and 50 S d. 60 S and 10 S
4. The amino acid is attached to .....end of t RNA.
   a. 5 'end b. 3' end
   c. D arm d. anticodon arm
5. Which of the following facts is true for transcription?
   a. The entire molecule of DNA is transcribed b. Only selected regions of DNA are transcribed
   c. The primary transcript are active RNA molecules d. All of the above
6. The codon(s) that terminate(s) protein biosynthesis:
   a. UAA b. UAG
   c. UGA d. All of them
7. The nitrogenous base that is never found in the genetic code:
   a. Adenine b. Guanine
   c. Thymine d. Cytosine
8. The intervening nucleotide sequences in m RNA that do not code for proteins are called:
   a. Exons b. Introns
   c. Nonsense codons d. None of the above
9. Who discovered DNA?
   a. Watson &Crick b. Friedrich Miescher
   c. Ronald Ross d. Gregor Johann Mendel
10. "Active factor is DNA which can cause transformation"-was a conclusion of which experiment?
    a. Avery, MacLeod AND McCarty b. Griffith's Experiment
    c. Hershey AND Chase d. None of the above

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 pneumonae*
    d. None

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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(PART-B : Descriptive)

Time : 2 hrs. 40 min. Marks : 50

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

1. What is a genetic code? Write the salient features of genetic code. 2+8=10
2. What are Okazaki fragments? Describe with illustration, the mechanism of replication in both leading and lagging strand. 2+8=10
3. What do you mean by RNA modification? Why should hnRNA be modified to mature RNA before translation? What are the different stages of its modification? 2+2+6=10
4. What is a promoter sequence? Describe how RNA Polymerase takes part in transcription process with illustrations. 2+8=10
5. What is Translation? Explain the mechanism of translation in prokaryotes with proper illustration. 2+8=10
6. What is the role of sigma factor in transcription? How is rho dependent transcription different from rho independent transcription? 3+7=10
7. What is Protein synthesis? Explain the mechanism of protein synthesis in prokaryotes with proper illustration. 2+8=10
8. Why DNA replication is called semidiscontinuous replication? Describe with illustration, the mechanism of replication in Telomeric site of DNA. 2+8=10

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