REV-01
MBT/05/10

2024/06

SET A

M.Sc. BIOTECHNOLOGY
SECOND SEMESTER
MOLECULAR BIOLOGY
MBT-201

[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. Which of the following is DNA made up of?
   a. Adenine – Guanine
   b. Cytosine – Thymine
   c. Both a and b
   d. None of the mentioned
2. Which of the following does not take part in gene expression?
   a. Transcription
   b. RNA processing
   c. Replication
   d. Translation
3. Which of the following is a type of RNA involved in protein synthesis?
   a. snRNA
   b. rRNA
   c. yRNA
   d. dsRNA
4. The part that plays a critical role in even distribution of parental DNA during division is:
   a. Telomere
   b. Centromere
   c. Spindle fibre
   d. Centrioles
5. Which of the following is RNA made up of?
   a. Adenine, Cytosine, Guanine, and Uracil
   b. Adenine, Guanine, Cytosine, and Thymine
   c. Adenine, Guanine, Uracil and Thymine
   d. Adenine, Uracil, Cytosine, and Thymine
6. In cancer telomerase activity.....
   a. Increases
   b. Decreases
   c. Remains constant
   d. Plays no role
7. Which of the following parts of the mRNA determines the specificity of the amino acid attached?
   a. Acceptor stem
   b. D loop
   c. ΨU loop
   d. Variable loop
8. 5-bromouracil is the analog of which base?
   a. Thymine
   b. Guanine
   c. Cytosine
   d. Uracil
9. In the following compound which is one of the intercalating agents?
   a. 5-bromouracil
   b. Purine
   c. Ethidium
   d. Clastrogen
10. Which of the following functions of DNA is necessary for evolution?
    a. Mutation
    b. Replication
    c. Translation
    d. Transcription

11. The site at which first tRNA bind is.....
    a. E
    b. p
    c. Ribosome
    d. A

12. The enzyme needed for resolving catenated DNA is.....
    a. Topoisomerase I
    b. Topoisomerase II
    c. Topoisomerase III
    d. Topoisomerase IV

13. Rho factors are needed in.....
    a. Activation
    b. Initiation
    c. Elongation
    d. Termination

14. The bond of RNA cap is.....
    a. 5′-3′
    b. 3′-5′
    c. 5′-5′
    d. 3′-3′

15. Charged tRNA consists of.....
    a. Anticodon
    b. Amino acid
    c. Amino acid and anticodon
    d. Free of amino acids

16. The immediate product of translation is.....
    a. Secondary structure
    b. Tertiary structure
    c. Primary structure
    d. Native protein

17. DNA-RNA-Protein: PTM after transcription is the condition found in.....
    a. Eukaryotes
    b. Prokaryotes
    c. Bacteria
    d. Valid for all

18. Number of monomers found in protein with 300 codons is.....
    a. 300
    b. 200
    c. 100
    d. 150

19. Choose the correct option.
    a. Gene is part of DNA
    b. DNA is the part of gene
    c. Gene and DNA are equal
    d. Gene and DNA are similar

20. Phytolyase is involved in .....repair system.
    a. UV
    b. Nucleotide
    c. Excision
    d. DNA

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Descriptive

Time : 2 hr. 30 mins. **Marks : 50**

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

1. Explain the structure of replicating fork indicating the enzymes involved in replication in prokaryotes. 5+5=10
2. What do you understand by RNA polymerase? Mention its parts and role in transcription. 3+7=10
3. Write the functions of E.P, A sites with suitable diagram. Explain how the termination occurs during translation. 6+4=10
4. What is DNA repair system? Illustrate the base excision repair system. 2+8=10
5. Define DNA. Describe the structure of DNA with the help of the Watson and Crick model. Also, give appropriate diagrams. 2+8=10
6. Describe in detail Griffith's experiment of bacterial transformation. Also, add appropriate diagrams. 10
7. Differentiate between: 2×5=10
   a) DNA and RNA
   b) Euchromatin and heterochromatin
8. Define operon. What are the different types of operons? Describe in detail an inducible operon. 2+2+6=10

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