

**M.Sc. ZOOLOGY  
THIRD SEMESTER  
CELL AND MOLECULAR BIOLOGY-I  
MSZ-303 A**

**SET  
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

*Choose the correct answer from the following:*

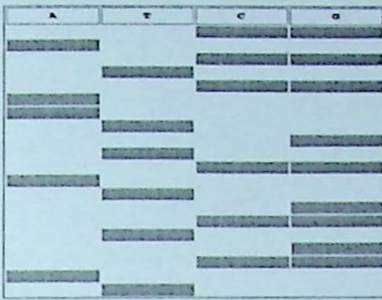
*1×20=20*

- Which substances are transported through facilitated diffusion?
  - Galactose
  - Urea
  - Oxygen
  - Alcohol
- Which of the following statement is NOT true?
  - Chemical changes leads to change in shape of pump
  - Symporters are the one which moves substances in different direction
  - Vitamin K is transported through simple diffusion
  - In passive transport, the substance moves down its concentration gradient
- Which statement best describes how cholesterol affects cell membrane fluidity?
  - Cholesterol increases fluidity at high temperatures and decreases fluidity at low temperature
  - Cholesterol increases fluidity at high temperatures and increases fluidity at low temperatures
  - Cholesterol increases fluidity at high temperatures and increases fluidity at low temperatures
  - Cholesterol decreases fluidity at high temperatures and increases fluidity at low temperatures
- Glucose typically enters the cell through which mechanism?
  - Pinocytosis through a channel protein
  - Active transport by a glucose transport protein
  - Simple diffusion through the cell membrane
  - Facilitated diffusion through a carrier protein
- Extracellular fluids are LEAST likely to move through the space between cells that are joined by which type of intercellular junction?
  - Desmosome
  - Tight junction
  - Macula adherens
  - Gap junction
- Receptor-mediated endocytosis:
  - Is a passive process
  - Involves only membrane transport proteins
  - Brings about the selective uptake of materials by enclosing them in membranous vesicles
  - Does not require energy
- A plant cell placed in a hypertonic solution will:
  - Remain unchanged
  - Undergo lysis
  - Undergo plasmolysis
  - Swell slightly

8. Nucleolus is the site of:  
 a. rRNA transcription  
 b. Ribosome assembly  
 c. Modification of snoRNAs  
 d. All the above
9. The most important function of nuclear envelope is to:  
 a. Regulate nucleo-cytoplasmic traffic  
 b. Protect genetic material  
 c. Prevent the entrance of active ribosomes in the nucleus  
 d. Synthesis of rRNAs
10. The number of snoRNAs present in nucleoli are around:  
 a. 300  
 b. 28  
 c. 200  
 d. 45
11. Mammalian cells have lamin genes which code for atleast .....proteins.  
 a. 3  
 b. 5  
 c. 7  
 d. 9
12. The number of nuclear pores depend on the:  
 a. Size of the cell  
 b. Transcriptional activity of the cell  
 c. DNA content of the cell  
 d. All the above
13. The study of full complement of proteins expressed by a genome is called:  
 a. Proteome  
 b. Proteomics  
 c. Genomics  
 d. Protein formation
14. Which of the following is correct regarding genomics?  
 a. It includes mapping of genome  
 b. It includes genome sequencing  
 c. It includes genome analysis  
 d. All of these
15. Genomes refers to the:  
 a. DNA of an organism  
 b. Total DNA and RNA of an organism  
 c. Entire genes of an organism  
 d. Total DNA, RNA and cDNA of an organism
16. In the mechanism of lipid peroxidation, the superoxides combine with  $H_2O$  to form  $H_2O_2$  with the help of an enzyme:  
 a. Superoxide dismutase  
 b. Superoxide peroxidase  
 c. Peroxide synthetase  
 d. Peroxide transferase
17. In the process of lipid peroxidation, free radicals mostly damages following type of lipids:  
 a. Phospholipids  
 b. Sphingomyline  
 c. Ceramide  
 d. Cholesterol
18. Which type of DNA cleavage is done in the Maxam Gilbert method?  
 a. Edge  
 b. Interstitial  
 c. Base-specific  
 d. Gene-specific
19. The Enzymatic method of DNA sequencing:  
 a. Uses RNA as template  
 b. Uses ddNTP in which the deoxyribose 3'-OH is missing  
 c. Uses ddNTP in which the deoxyribose 3'-OH is present  
 d. Uses different chemical treatment to cleave DNA preferentially at A, T, C or G



20. Based on this figure, we can deduce what DNA sequence? (assume the anode is at the bottom)



- a. 5'-CACTCAATGTCATGCTGCAT-3'
- b. 5'-TACGTCGFACTGTAACTCAC-3'
- c. 5'-GAGTGAATGTGATGGTGGAT-3'
- d. The scientist's error renders it impossible to determine the DNA sequence

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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 do you mean by Lipid peroxidation? Discuss the mechanism of Lipid peroxidation.  | 2+8=10   |
| 2. What do you mean by DNA sequencing? Explain briefly the Chain termination method of DNA sequencing. How it is different from Chemical degradation method? | 2+6+2=10 |
| 3. Write a note on the structure of nuclear envelope. Explain briefly the role of nuclear envelope and traffic between nucleus and cytoplasm.                | 5+5=10   |
| 4. Write a detailed note on the structure of Nuclear pore complex with labeled diagram.  | 10       |
| 5. Write about any two types of cell to cell interactions. Explain with examples about primary and secondary active transporters.                            | 4+6=10   |
| 6. Explain with proper diagrams about the different types of membrane proteins. What are the different classes of lipids found in the plasma membrane?       | 6+4=10   |
| 7. What is Genome, Transcriptomes and Proteomes? Write about their molecular features and functions.   | 4+6=10   |
| 8. Distinguish between the genetic map and physical map. Discuss on various markers of physical map of DNA or gene.  | 2+8=10   |

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