

M.Sc. ZOOLOGY
THIRD SEMESTER
CELL & MOLECULAR BIOLOGY
MSZ-303 A

Duration: 3 Hrs.

Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

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

1. What is lipid peroxidation? Describe the mechanism of lipid peroxidation. (10)
2. What are the various active and passive mechanisms by which substances cross the plasma membrane? (10)
3. What roles do lamins play in nuclear structure and function? What is the function of snoRNAs? (10)
4. Explain the selective transport of proteins to and from the nucleus with illustrative diagrams. (10)
5. Define genome mapping. State how you would determine physical map of a particular gene. (10)
6. Define Genome, Transcriptome and Proteome. State the interaction among these three parameters. (10)
7. What do you mean by DNA sequencing? Explain briefly the Chain termination method of DNA sequencing. (10)
8. Describe the properties of three classes of membrane proteins and how are they associated in the lipid bilayer? (10)

== *** ==

M.Sc. ZOOLOGY
THIRD SEMESTER
CELL & MOLECULAR BIOLOGY
MSZ-303 A

[PART-A : Objective]

Choose the correct answer from the following :

1×20=20

1. The process of sorting and transporting newly synthesized proteins to correct destination in a cell is called:
 - a. Protein sorting
 - b. Protein targeting
 - c. Protein trafficking
 - d. All the above
2. Secretory proteins are synthesized by:
 - a. Free ribosome.
 - b. Ribosomes on endoplasmic reticulum.
 - c. Ribosomes on nuclear membrane.
 - d. All the above.
3. Nuclear localization signal that ensures transport of a protein to the nucleus is rich in:
 - a. Lysine and arginine.
 - b. Glutamine and asparagines.
 - c. Serine and threonine.
 - d. Tryptophan and histidine.
4. Nucleolus is the site of:
 - a. rRNA transcription.
 - b. Ribosome assembly.
 - c. Modification of snoRNAs.
 - d. All the above.
5. 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.
6. Which of the following are true about ion channels?
 - a. They are opened either by binding of ligands or by changes in electric potential across the membrane.
 - b. They require ATP.
 - c. They are open most of the time.
 - d. The rate of transport is slow compared to the rate of transport via carrier protein.
7. Which of the following statements are true in case of fluid mosaic model of plasma membrane?
 - P) 5-8nm thick and appears trilaminar when viewed in cross section under electron microscope.
 - Q) Less than 1nm thick and consist of a layer of protein sandwiched between two layers of phospholipids.
 - R) In the lipid bilayer, proteins are embedded at regular intervals and held by hydrophilic interactions between lipids and hydrophilic domains of the proteins.
 - S) The protein domains exposed on one side of the lipid bilayer are different from those exposed on other side.
 - a. P & Q
 - b. P & S
 - c. Q & S
 - d. P & R
8. Which of the following statements are false about the glucose transporter (GLUT)?
 - a. It transports glucose across the membrane via facilitated diffusion.
 - b. It has 12 alpha-helical transmembrane segments.
 - c. A conformational change in the transporter is involved in the transport process.
 - d. Glucose transportation is size dependent.
9. Ionophores are:
 - a. gating mechanisms associated with the transport of proteins.
 - b. intrinsic proteins that passively transports ions.
 - c. chemicals that form pores in the plasma membrane and allow ions to pass.
 - d. intrinsic proteins that actively transports ions.
10. The force that drives an ion through a membrane channel depends upon:
 - a. the size of the channel.
 - b. the size of the ion.
 - c. the size of the membrane.
 - d. the difference in the electric potential across the membrane.
11. The principle of Sanger's method relies on the use of:
 - a. chemicals for base specific cleavage.
 - b. dNTPs for chain termination.
 - c. ddNTPs for chain termination.
 - d. ³²P chain termination.
12. Which of the following is not a DNA sequencing method?
 - a. LMPCR.
 - b. Edman's method.
 - c. Sanger's method.
 - d. Maxam- Gilbert method.
13. The variation between two individual could well be marked by:
 - a. VNTR
 - b. RFLP
 - c. SSR
 - d. AFLP



14. In the mechanism of lipid peroxidation, the superoxides combine with H₂O to form H₂O₂ with the help of an enzyme:
 - a. Superoxide dismutase.
 - b. Superoxide peroxidase.
 - c. Peroxide synthetase.
 - d. Peroxide transferase.
15. 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.
16. In Sanger's method of DNA sequencing, the growing DNA chains are terminated because:
 - a. DNA polymerase is not very processive.
 - b. A radioactive nucleotide is incorporated.
 - c. The substance become limiting.
 - d. A phosphodiester bond cannot be made.
17. Single Nucleotide Polymorphism (SNP) means:
 - a. One nucleotide difference in sequence of two organisms.
 - b. Single nucleotide difference in sequence of single organism.
 - c. Single nucleotide polymorphism in multiple sequence of single organism.
 - d. Single nucleotide polymorphism in multiple sequences in multiple organisms.
18. PAUP is a bioinformatics software used in:
 - a. Homology searching.
 - b. Database searching.
 - c. Phylogenetic tree construction.
 - d. Visualizing 3D structure of protein.
19. How are the different nucleotides (A, C, G, or T) labeled in a chain termination sequencing reaction?
 - a. The primers for the reactions are labeled with fluorescent dyes.
 - b. The different deoxynucleotides are each labeled with a different fluorescent dye.
 - c. The different dideoxynucleotides are each labeled with a different fluorescent dye.
 - d. The different sequencing products are stained with antibodies that detect the different dideoxynucleotides.
20. VNTR are also known as:
 - a. Minisatellite.
 - b. Microsatellite.
 - c. Megasatellite.
 - d. Restriction Endonuclease.

== *** ==

Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2017-18 Date :

Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

.....
Scrutinizer's Signature

.....
Examiner's Signature

.....
Invigilator's Signature