Roll No. ..... Total Printed Pages - 8

F - 532

M.Sc. (Second Semester)
EXAMINATION, May - June, 2022
Zoology
Paper - I
[Molecular Cell Biology and Biotechonogy]

Time : Three Hours] *[Maximum Marks : 80*

Note: Attempt all the sections as directed.

(Section - A)

(Objective/Multiple Choice Questions)

(1 mark each)

Note- Attempt all questions.

Choose the correct answer :

1. Which of the following process requires membrane proteins?
   (A) Phagocytosis
   (B) Exocytosis
   (C) Receptor mediated endocytosis
   (D) Pinocytosis

2. Unwinding of DNA is done by
   (A) Ligase
   (B) Hexanuclease
   (C) Helicase
   (D) Topoisomarase
3. Which of the following is not an mRNA codon?
   (A) TAC
   (B) UCU
   (C) UUG
   (D) UUU
4. A Chromosome with a very short arm and a very long arm is referred to as:
   (A) Telocentric
   (B) Submetacentric
   (C) Metacentric
   (D) Acrocentric
5. Negative regulation of protein synthesis is accomplished by :
   (A) The binding of a repressor to the DNA
   (B) allosteric inhibition
   (C) The binding of RNA polymerase to the promoter
   (D) The binding of a repressor to the RNA polymerase

6. If a gene is inactivated by gene targeting then it is called as-
   (A) Knock-out gene
   (B) Knock-in gene
   (C) Insertional inactivation
   (D) gene disruption
7. PCR technique is developed by
   (A) Milstein
   (B) Kohler
   (C) Kary Mullis
   (D) Altman
8. Which of the energy rich molecules required for initiation of translation
   (A) GTP
   (B) ATP
   (C) CTP
   (D) AMP
9. Cilia and flagella of eukaryotic cells are made up of :
   (A) Tubulin
   (B) Desmin
   (C) Lamin
   (D) Keratin

10. Which one is not a function of mitochondria-
    (A) Non shivering thermogenesis
    (B) Fatty acid breakdown
    (C) Glycolysis and associated ATP production
    (D) Electron transport chain and associated ATP production
11. Lysosomes are not present in which of the following cells?
    (A) Macrophages
    (B) Erythrocytes
    (C) Hepatocytes
    (D) Muscles cells
12. A promoter site on DNA:
    (A) Regulates termination
    (B) Initiates transcription
    (C) Transcribes represssor
    (D) Code for DNA
13. The enzyme that catalyses the splitting of PIP2 into two molecules of inositol triphosphate (IP3) and diacylglycerol in cell signalling is :
    (A) Lipokinase
    (B) Phosphodiaestarase C
    (C) Phospholipase C
    (D) Phosphokinase C

14. Transfection refers to which of the following?

    (A) The process by which a cell become malignant

    (B) Synthesis of protein based on mRNA sequences

    (C) Synthesis of mRNA from DNA templet

    (D) Intoduction of forreign gene into a cell

15. Animal farming can be defined as:

    (A) Programming animals to produce novel products

    (B) Generating transgenic animals for farming

    (C) Growing animals for farming

    (D) None of these

16. Polymerase used in the PCR techniques is extracted from:

    (A) E.Coli

    (B) Candida albicans

    (C) Thermus aquaticus

    (D) Rana tigrine

17. Which of the following technique is suitable for identifying mRNA molecules in a sample?

    (A) Northern blotting

    (B) Southern blotting

    (C) Eastern blotting

    (D) Western blotting

18. Transgenic animals have:

    (A) Foreign lipid

    (B) Foreign amino acid

    (C) Foreign gene

    (D) Foreign proteins

19. embryonic stem cells are:

    (A) Small sized

    (B) Unipotent

    (C) Large sized

    (D) Pluripotent

20. Probe is a :

    (A) Short piece of labelled DNA which are complementary to the nucleic acid strand to be detected

    (B) Short piece of labelled DNA or RNA which are complementary to the nucleic acid strand to be detected

    (C) Protein for detecting a specific DNA molecule

    (D) None of these

Section - B

(Very Short Answer Type Questions)

(2 marks each)

Note: Attempt all questions. Answer in 1-2 sentences.

1. Draw the well labelled diagram of Golgi complex.

2. Write 2 differentiating characters that differentiate cilia

from flagella.

3. An anticodon of a t RNA has the sequence 5 'GCA3', what amino acid does this t RNA carry?
4. Name different enzymes involved in replication of DNA.
5. Write 2 properties of physical map.
6. Give 2 example of non-coding DNA.
7. What is transfection ?
8. What is totipotent and pluripotent stem cells.

Section - C

(Short Answer Type Questions)

(3 marks each)

Note: Attempt all questions. Answer each questions in about 75 words.

1. Discuss active transport across the plasma membrane.
2. Describe role of microtubules in Mitosis.
3. Explain the mechanism of regulation of translation.
4. Write characteristics of Genetic Code.
5. Write a note on molecular markers.
6. Describe structure of lambrush Chromosomes with well labelled diagram.
7. How transgenic animals are formed using embryonic stem cells?

8. Write a note on knockout mice.

Section - D

(Long Answer Type Questions)

(5 marks each)

Note : Attempt all questions. Answer in about 150 words.

1. Write structure and function of Mitochondria.

OR

Write structure and function of Ribosomes.

2. Describe the methods of DNA replication.

OR

Describe the process of Transcription in eukaryotes.

3. Write an essay on PCR.

OR

Discuss blotting techniques in detail.

4. Write the application of genetic engineering in the field of medicine and industry.

OR

Write a detail note on transgenic amimals.