

Roll No.

E-532

**M. Sc. (Second Semester) (ATKT)
EXAMINATION, May-June, 2021**

ZOOLOGY

Paper First

(Molecular Cell Biology and Biotechnology)

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt all Sections as directed.**Section—A**

1 each

(Objective/Multiple Choice Questions)**Note :** Attempt all questions.

Choose the correct answer :

1. Fredrick Griffith used *Streptococcus pneumonia* to prove which of the following ?
 - (a) DNA is genetic material.
 - (b) RNA is genetic material.
 - (c) Protein is genetic material.
 - (d) Transforming principle.

2. Which of the following stores the genetic information stored in DNA?
 - (a) Sugar
 - (b) Phosphate
 - (c) Nitrogenous base
 - (d) Polymerase
3. Which of the following pairs is incorrect ?
 - (a) Proteins — Peptide bond
 - (b) Nucleic acid — Hydrogen bond
 - (c) Polysaccharide — Glycosidic bond
 - (d) Phospholipids — Phosphate linkage
4. Which of the following pairs is correct ?
 - (a) Purine — Adenosine, Thymidine
 - (b) Purine — Guanosine, Thymidine
 - (c) Pyrimidine — Thymidine, Cytidine
 - (d) Pyrimidine — Uridine, Adenosine
5. Chargaff's rule for two strands of DNA has :
 - (a) Same molecular weight
 - (b) Same amount of A and G
 - (c) Different amount of A and G
 - (d) Different molecular weight

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6. Nucleotide bases are :
- (a) Aliphatic
 - (b) Heterocyclic
 - (c) Planar
 - (d) Ubiquitous
7. Nucleotides do not act as :
- (a) Receptors
 - (b) Ribozyme
 - (c) Energy carrier molecules
 - (d) Nucleic acid monomer
8. Reverse transcription in SARS-CoV-2 produces :
- (a) cDNA from DNA
 - (b) RNA from cDNA
 - (c) DNA from RNA
 - (d) RNA from DNA
9. Polymerase Chain Reaction (PCR) are :
- (a) Single stranded DNA oligonucleotide
 - (b) Double stranded DNA oligonucleotide
 - (c) Single stranded RNA oligonucleotide
 - (d) Double stranded RNA oligonucleotide

10. During Polymerase Chain Reaction (PCR) the DNA and primer joins at :
- (a) 42°
 - (b) 54°
 - (c) 74°
 - (d) 96°
11. The enzyme active at 72° during Polymerase Chain Reaction (PCR) is :
- (a) Isomerase
 - (b) Exonuclease
 - (c) Polymerase
 - (d) Endonuclease
12. In the beads of Nucleosome comprises of :
- (a) 6 histone proteins
 - (b) 8 histone proteins
 - (c) 6 histone proteins and DNA
 - (d) 8 histone proteins and DNA
13. DNA and histone are linked by :
- (a) Covalent bonding
 - (b) Hydrogen bonding
 - (c) Hydrophobic bonding
 - (d) van der Waals interactions

14. DNA threads which appear during cell division are :
- (a) Spindle fibres
 - (b) Centrioles
 - (c) Asters
 - (d) Chromosomes
15. Which of the following links together sister chromatids after replication ?
- (a) Cohesins
 - (b) Condensins
 - (c) Histones
 - (d) Topoisomerases
16. The unit of a genetic map is :
- (a) Centimetres
 - (b) Nanometer
 - (c) Angstrom
 - (d) Centimorgan
17. RFLP stands for : :
- (a) Restriction Fragment Length Polymorphisms
 - (b) Random Fragment Length Polymerization
 - (c) Restriction Fragment Length Polymers
 - (d) Restriction Fragment Long Polymers

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18. When two genes are unlinked the recombination, frequency is :
- (a) 25%
 - (b) 50%
 - (c) 75%
 - (d) 100%
19. Which type of restriction endonucleases is used most in genetic engineering ?
- (a) Type I
 - (b) Type II
 - (c) Type III
 - (d) Type IV
20. Which of the following activity is not possible in DNA polymerase I ?
- (a) 3'-5' exonuclease
 - (b) 5'-3' exonuclease
 - (c) 5'-3' DNA synthesis
 - (d) 3'-5' DNA synthesis

Section—B

2 each

(Very Short Answer Type Questions)

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

1. Write any *two* features of integral membrane proteins.
2. Write any *two* features of active transport.
3. What are *two* main anatomical features of flagella ?
4. Write any *two* eukaryotic transcriptional factors and their functions.

[7]

E-532

5. What are codons ? Give *two* examples of codons.
6. Write *two* features of genetic maps.
7. Write *two* applications of Northern blotting technique.
8. With appropriate examples write any *two* medical applications of genetic engineering.

Section—C

3 each

(Short Answer Type Questions)

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

1. What are the types of lipids found in plasma membrane ?
2. Describe structure and functions of lysosomes.
3. Describe structure and functions of dynein.
4. Describe the postulates of Wobble hypothesis.
5. Describe the main features of termination of eukaryotic translational chain.
6. Explain with examples non-coding DNA.
7. Describe the process of PCR.
8. Differentiate between knock out and knock in transgenic animals.

Section—D

5 each

(Long Answer Type Questions)

Note : Attempt all questions. Answer *one* question from each Unit in about 150 words.

Unit-I

1. Describe the various methods of transport across the plasma membrane.

Or

Describe the process of signal transduction mechanism.

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[8]

E-532

Unit-II

2. Describe the process of translation in eukaryotes.

Or

Describe the process of regulation of translation in eukaryotes.

Unit-III

3. Citing examples, describe the morphological and structural variations of human chromosomes.

Or

Describe the molecular markers used in genome analysis with examples.

Unit-IV

4. Describe the methods of producing transgenic animals with examples.

Or

Citing appropriate examples, describe applications of embryonic stem cells.

E-532