Roll No. .....

D–1007

M. Sc. (Fourth Semester) (Main/ATKT)

EXAMINATION, May-June, 2020

ZOOLOGY

(Optional Group—B)

Paper Third

(Cell Biology)

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. Chromatin has :
   (a) DNA
   (b) DNA and Protein
   (c) DNA, RNA and Protein
   (d) None of the above

2. Which of the following histone pairs froms tetramers in solution ?
   (a) H1, H2A
   (b) H2A, H2B
   (c) H2B, H3
   (d) H3, H4

3. Gene that shows tendency to be inherited together is known as :
   (a) Linkage group
   (b) Homologous group
   (c) Co-dependent gene
   (d) None of the above

4. Loops in lampbrush chromosome represent site of :
   (a) Replication
   (b) Transcription
   (c) Cell division
   (d) Crossing over

5. During DNA denaturation, which of the following occurs ?
   (a) Unwinding of DNA double strand
   (b) Absorbance of UV rays
   (c) Decrease in hydrophobic interactions of base stacking
   (d) All of the above

6. Replication starts at a unique point is known as ..... .
   (a) Origin
   (b) Centromere
   (c) Primary constriction
   (d) Telomere

7. The shortest chromosomal unit capable of undergoing mutation has been called ..... .
   (a) Mutant DNA
   (b) Muton
   (c) Cistron
   (d) Recon

8. During synthesis of protein, the translation process consists of :
   (a) Activation of amino acid
   (b) Transfer of amino acid to t-RNA
   (c) Initiation of polypeptide chain
   (d) All of the above

9. Lysosomes are known as "Suicidal bag" because :
   (a) Parasitic activity
   (b) Presence of food vacuole
   (c) Hydrolytic activity
   (d) Catalytic activity

10. What is the correct dorso ventral arrangement seen in a cross-section of *Drosophila* embryo ?
   (a) Amnioserosa, mesoderm, dorsal ectoderm, ventral ectoderm
   (b) Dorsal ectoderm, mesoderm, ventral ectoderm, amnioserosa
   (c) Amnioserosa, dorsal ectoderm, ventral ectoderm, mesoderm
   (d) None of the above

11. The portion of the *Drosophila* body plan which will produce the wing is called :
   (a) Thorax
   (b) Abdomen
   (c) Telson
   (d) Neurectoderm

12. The egg of *Drosophila* is :
   (a) Mesolecithal
   (b) Centrolecithal
   (c) Oligolecithal
   (d) Alecithal

13. This type of thalassemia disease is Cooley anaemia :
   (a) Alloimmunization
   (b) Beta-thalassemia
   (c) Alpha-thalassemia
   (d) None of the above

14. Thalassemia is most often treated with :
    (a) Red blood cell transfusion
    (b) White blood cell transfusion
    (c) Plasma transfusion
    (d) Both (a) and (b)

15. The gene responsible for cousing Duchenne muscular dystrophy is found on :
    (a) Y-chromosome
    (b) X-chromosome
    (c) Autosomal chromosom-5
    (d) Autosomal chromosome-8

16. Which protein causes Duchenne muscular dystrophy ?
    (a) Actin
    (b) Myotrophin
    (c) Dystrophin
    (d) Leucovorin

17. Euchromatin is the :
    (a) lightly packed form of chromatin
    (b) tightly packed form of chromatin
    (c) concentrated form of chromatin
    (d) elongated form of chromatin

18. Synapsis is defined as the pairing of ..... .
    (a) Acentric chromosome
    (b) Any chromosome
    (c) Non-homologous chromosome
    (d) Homologous chromosome

19. Chromosome structure can be observed best during :
    (a) Anaphase
    (b) Mataphase
    (c) Prophase
    (d) Telophase

20. Cdk^2/cydin E functions in :
    (a) G_2/M transition
    (b) G_2
    (c) M
    (d) G_1/S transition

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions. Answer within **1-2** sentences each.

1. What is satellite ?
2. What is Okazaki pieces ?
3. Define endonuclease.
4. What is genome ?

5. What is stress gene ?
6. Which type of egg is found in *Drosophilla* ?
7. Which type of cleavage occurs in *Drosophilla* ?
8. What is regulator gene ?

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions. Word limit is **75** words.

1. Define Balbiani rings in chromosomes.
2. Define superficial cleavage in *Drosophilla.*
3. Write the characteristics of DNA polymerases.
4. Give a brief account on evolutionary significance of homeoboxes.
5. Define chlorine genes.
6. Define muscular dystrophy.
7. Define gene as a unit of mutation.
8. What do you understand by overlapping gene ?

Section—D 5 each

(Long Answer Type Questions)

Note : Attempt all questions. World limit **150** words.

1. Write a detailed account on the molecular organization of eukaryotic chromosome with suitable diagrams.

Or

Explain the structural organization and functional significance of lampbrush chromosome.

2. Describe the structural organization of Eukaryotic Gene.

Or

Explain gene families with examples.

3. Explain the DNA rearrangement.

Or

Write a detailed account of environmental modulation of gene activity.

4. Write down the process of gastrulation in *Drosophila melangogaster*.

Or

Describe the evolutionary significance of homeoboxes.