

2025

ZOOLOGY — HONOURS

Paper : DSCC-1

(Cell Biology)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Section – A

1. Answer **any ten** questions :

2×10

- (a) What do you mean by symporter and antiporter?
- (b) What is the role of cholesterol in plasma membrane?
- (c) Mention the role of signal recognition particle (SRP).
- (d) What do you mean by autophagosome?
- (e) Why are the lysosomes called “suicidal bags”?
- (f) In an organism 30% of the bases of its double stranded DNA is Adenine. Calculate the percentage of other three bases present in its DNA.
- (g) Why is serum used for in culture media?
- (h) What is MTOC?
- (i) What are ribozymes?
- (j) What is OriC?
- (k) What are tight junctions?
- (l) What is chromatosome?
- (m) What are v SNARE and t SNARE?
- (n) What is freeze etching?
- (o) What is T_m ?

Section – B

2. Write short notes on **any three** of the following :

5×3

- (a) Nuclear pore complex
- (b) Watson-Crick Model of DNA structure

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- (c) Frye-Edidin experiments
- (d) Okazaki fragments
- (e) Vesicular trafficking.

Section – C

Answer *any four* questions.

3. (a) Compare between membrane channel, transporter and pump.
 (b) Describe 'solenoid model of chromatin' with suitable diagram.
 (c) Name any two lysosomal acid hydrolases. 3+5+2
4. (a) Write a note on FRAP assay.
 (b) Explain chemiosmotic hypothesis.
 (c) Differentiate between microtubule, microfilaments and intermediate filaments. 3+4+3
5. (a) What is Hyperchromic shift?
 (b) How did the results rule out conservative and dispersive model of replication in Meselson and Stahl Experiment? Which model was accepted and why?
 (c) Describe the role of following proteins in replication :
 (i) Helicase, (ii) Primase. 2+(3+2)+(1½+1½)
6. (a) Differentiate between primary cell culture and cell line.
 (b) Why is rapid freezing essential in freeze-fracture technique?
 (c) Write the working principle of phase contrast microscope with neat diagram. (2+2)+2+(3+1)
7. (a) What do you mean by 'End replication problem' in eukaryotes? How is it solved? Explain with suitable diagram.
 (b) Calculate the minimum limit of resolution possible for a light microscope, if maximum value of numerical aperture is 1.2 and wavelength of light is 470 nm.
 (c) What is Klenow fragment? (2+3)+3+2
8. (a) Describe the structure of F_1 particle with a suitable diagram.
 (b) What is an ultracentrifuge? Write the principle behind working of ultracentrifuge.
 (c) Why RNA is less stable than DNA? 4+(2+2)+2
9. (a) Write a brief account on the major classes of macromolecules that constitute the Extracellular Matrix.
 (b) What are desmosomes?
 (c) Write down the salient features of centromeric DNA. 5+2+3