

2021

ZOOLOGY — HONOURS

Paper : CC-4

(Cell Biology)

Full Marks : 50

The figures in the margin indicate full marks.

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

Answer **any ten** questions.

1. (a) Define membrane fluidity.
(b) Briefly describe an experiment to prove the fluidity of plasma membrane. 1+4
2. (a) What is meant by N-linked glycosylation of proteins?
(b) State the process of N-linked glycosylation in Endoplasmic reticulum. 2+3
3. Discuss the structure of nucleosome, their hierarchical packaging with suitable diagram. 5
4. (a) With a suitable diagrammatic illustration explain signal transduction through the JAK-STAT pathway.
(b) Give example of two signalling molecules that elicit JAK-STAT pathway. 4+1
5. (a) Distinguish between proto-oncogene and tumor suppressor genes with suitable examples.
(b) Illustrate how mutation in *ras* proto-oncogene can convert it into oncogene. 2+3
6. Write short notes on (**any two**) : 2½+2½
 - (a) Nuclear pore complex
 - (b) Zonula adherence
 - (c) Kinetochores
 - (d) Philadelphia chromosome.
7. (a) Define vesicular transport.
(b) Mention the role of COPI, COPII and clathrin coated vesicles in intracellular transport. 2+(1+1+1)

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8. Compare and contrast (*any two*) : 2½+2½
- (a) Active transport and passive transport
 - (b) Pro-apoptotic and anti-apoptotic gene
 - (c) Simple diffusion and facilitated diffusion
 - (d) Apoptosis and necrosis.
9. Mention the role of P₅₃ protein and Retinoblastoma [Rb] protein during mammalian G1-S transition. 2½+2½
10. (a) What are vSNARE and tSNARE? 2+(2+1)
- (b) Mention the structure and function of F₀-F₁ ATP synthase.
11. (a) Write briefly on the accessory proteins of microfilament and microtubules. 3+2
- (b) Define cyclin and CDK.
12. With suitable illustrations mention the extrinsic pathway of apoptosis. 5
13. (a) Diagrammatically explain lysosomal protein modification in Golgi.
- (b) Define cis/forming face and trans/maturing face of Golgi. 3+2
14. (a) Mention two structural and two functional dissimilarities between normal and transformed cells.
- (b) Classify plasma membrane receptors. 2+3
15. Mitochondria is Semi-autonomous — Explain. Distinguish between glyoxisome and peroxisome. 3+2
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