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 shorts notes on (***any two***) : 2½+2½

(a) Nuclear pore complex

(b) Zonula adherence

(c) Kinetochore

(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)

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 P_{53} protein and Retinoblastoma [Rb] protein during mammalian G1-S transition. 2½+2½

10. (a) What are vSNARE and tSNARE?

(b) Mention the structure and function of F0-F1 ATP synthase. 2+(2+1)

11. (a) Write briefly on the accessory proteins of microfilament and microtubules.

(b) Define cyclin and CDK. 3+2

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