2023

(May/June)

BIOCHEMISTRY

(Honours)

(Cell Biology and Physiology)

(BCHEM–401)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **four** questions, taking *any* **two** from each Part

PART—A

(Cell Biology)

1. *(a)* Briefly explain the biological roles of endoplasmic reticulum and Golgi apparatus in animal cells. 5

(b) What is subcellular fractionation? Why is it important in cell biology? Mention the working of differential centrifugation and its significance. 1+1+4=6

(c) What is bacterial taxis? What do you understand by negative and positive taxis? Explain. 3

2. (a) What is cell division? What is the importance of cell division? Explain. 4

(b) In cell cycle, what is interphase? Discuss the different phases in interphase and their significance. 6

(c) What is M-phase? Explain the different stages in M-phase. 4

3. (a) What is apoptosis? Explain its significance. 4

(b) How is apoptosis different from necrosis? Explain. 6

(c) Describe briefly the apoptotic pathway. 4

4. (a) Explain some of the unique properties of all stem cells. 4

(b) What are pluripotent and adult stem cells? Explain with relevant examples. 7

(c) Explain what is induced pluripotent stem cells. 3

PART—B

(Physiology)

5. (a) Discuss the digestion of nucleic acids in the intestine of animals. 5

(b) What are Bohr effect and Haldane effect? Explain with diagrams. 5

(c) Mention the various factors that influence O_2 binding to hemoglobin in the RBCs. 4

6. (a) What is blood clotting? Explain the intrinsic pathway of blood clotting with diagram. 6

(b) Mention the roles of ADH and aldosterone. 4

(c) With illustration, describe the visual cycle in the eye. 4

7. (a) What are hormones? In what form do they carry message? Differentiate among endocrine, paracrine and autocrine hormones. 1+1+3=5

(b) What roles do insulin and glucagon play in animals? 4

(c) Using illustration, explain the mechanism of hormonal action involving the $Ca^{2+}/IP_3/DAG$ pathways. 5

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