

2021

BIOCHEMISTRY— HONOURS

Paper : CC-7

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.*

1. Answer **any five** questions: 2×5
- (a) Define numerical aperture (NA) of a microscope.
 - (b) How does confocal microscopy differ from fluorescence microscopy?
 - (c) Mention two similarities between mitochondria and *Rickettsia prowazekii*.
 - (d) What is Nuclear Localization Signal?
 - (e) Differentiate between apoptosis and necrosis.
 - (f) What is meant by secondary cell walls of plants?
 - (g) What is the major function of cell matrix?
 - (h) What is endocytosis?
 - (i) What is ubiquitin?
 - (j) How can you differentiate between a plant cell and an animal cell, under the microscope?
2. Answer **any two** questions:
- (a) What is subcellular fractionation? How can you isolate mitochondria by using subcellular fractionation? 2+3
 - (b) What is retrograde transport of proteins? What is the role of COPI in protein transport? 3+2
 - (c) What are the major functions of microfilaments? What is the major purpose of staining the cells? 3+2
 - (d) Why we get a greater magnification in electron microscope than in light microscope? How do eubacterial cell walls differ from that of archaea bacterial cell walls? 2+3

Unit-I

Answer **any one** question.

3. (a) What are RER and SER? State their functions? Why is the inner mitochondrial membrane highly invaginated? What are these invaginations called?

Please Turn Over

- (b) Mention three structural components of a bacterial flagellum along with their function. Mention two uses of fluorescent microscopic technique. {(1+1)+(2+1)}+3+2
4. (a) Do the number of Nuclear Pore Complex remain constant throughout the cell cycle? Justify your answer. How do peroxisome facilitate lipid metabolism? 2+3
- (b) How do peroxisome facilitate processing of reactive oxygen species? What function chloroplasts display other than photosynthesis? (2+3)+ (2+3)

Unit-II

Answer *any one* question.

5. (a) Schematically describe how actin proteins are polymerized.
- (b) What is the major function of intermediate filament?
- (c) Can the cytoskeleton change in response to the environment?
- (d) Schematically describe how cytoskeleton helps in a ameoboid movement. 3+2+2+3
6. (a) What is the function of colchicine?
- (b) What are the major functions of tight junctions?
- (c) What are the focal adhesions?
- (d) How do focal adhesions facilitate cell migration? 2+3+2+3

Unit-III

Answer *any one* question.

7. (a) Schematically describe the function of
- (i) exportin and
- (ii) importin in protein transport across nuclear pore complexes.
- (b) What are the major functions of —
- (i) COP I
- (ii) COP II and
- (iii) Clathrin in protein transport 2½+2½+1½+1½+2
8. (a) Briefly describe significance of the check points in eukaryotic cell cycle.
- (b) What is metaphase plate? What is linker DNA?
- (c) What is the major function of cyclins?
- (d) What is vesicle budding? 3+(1½+1½)+2+2
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