

**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  $2\frac{1}{2}+2\frac{1}{2}+1\frac{1}{2}+1\frac{1}{2}+2$
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?  $3+(1\frac{1}{2}+1\frac{1}{2})+2+2$