



Name :

Roll No. :

Invigilator's Signature :

CS/B.Sc. (H)/Micro.Bio./BT/Mol.Bio./Genetics/SEM-1/CSD-103/2012-13

2012

CELL STRUCTURE AND DYNAMICS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Which of the following structures is the substitution of mitochondrion in bacteria ?
 - a) Genophore
 - b) Moron
 - c) Mesosome
 - d) None of these.
- ii) Prokaryotic cell does not possess
 - a) nuclear membrane
 - b) histone protein
 - c) double stranded DNA
 - d) both (a) and (b).



- iii) DNA is present in the following eukaryotic cell structures *except*
- a) Nucleus
 - b) Mitochondrion
 - c) Centriole
 - d) Plastid.
- iv) Protoplasm is a
- a) true solution
 - b) colloidal solution
 - c) emulsion
 - d) suspension.
- v) Longest animal cell is
- a) Ostrich egg
 - b) Epithelial cell
 - c) Muscle cell
 - d) Nerve cell.
- vi) 'Energy currency' of the cell is
- a) ATP
 - b) ADP
 - c) AMP
 - d) Cyclic AMP.
- vii) The endosymbiotic hypothesis attempts to explain
- a) the origin of mitochondria and chloroplast
 - b) how cells reproduce
 - c) how photosynthesis occurs
 - d) the differences between plant and animal cells.
- viii) The chaperonin present in bacteria is
- a) TriC
 - b) GroEL
 - c) Hsp70
 - d) none of these.
- ix) Passage through pores in the nuclear envelope is restricted primarily to
- a) proteins, RNA, and protein-RNA complexes
 - b) lipids and glycolipids
 - c) DNA and RNA
 - d) RNA and protein-carbohydrate complexes
 - e) marker proteins for the plasma membrane.



- x) Within chloroplasts, light is captured by
- a) grana within cisternae
 - b) thylakoids within grana
 - c) cisternae within grana
 - d) grana within thylakoids
 - e) none of these.
- xi) The Golgi apparatus is involved in
- a) transporting proteins that are to be released from the cell
 - b) packaging proteins into vesicles
 - c) altering or modifying proteins
 - d) producing lysosomes
 - e) all of these.
- xii) The cytoskeleton includes all of the following *except*
- a) microtubules
 - b) intermediate filaments
 - c) myosin filaments
 - d) actin filaments
 - e) all of these are included.
- xiii) The smooth ER is especially abundant in cells that synthesize extensive amounts of
- a) toxins
 - b) proteins
 - c) enzymes
 - d) lipids.
- xiv) Smaller cell is
- a) less active metabolically
 - b) with smaller nucleus
 - c) with larger nucleus
 - d) more active metabolically.



GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Describe the active transport system of solutes across the cell membrane.
3. Briefly describe the mitochondrial pathway of apoptosis.
4. Explain the structure of plant cell wall with proper diagram.
5. Explain why lysosomes are called 'suicidal bag' of cell ?
6. Write a short note on vesicle mediated transport of plasma membrane.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Name the stages of cell cycle. Discuss the concept of checkpoints in regulation of cell cycle. What is MPF ? 'p53 is the guardian of our genome.' Explain it. $3 + 6 + 2 + 4$
8. What is signal recognition particle ? Discuss the event of contranlational translocation in endoplasmic reticulum. How are misfolded proteins degraded in ER ? $2 + 7 + 6$
9. Give the diagram of flagella with proper labeling. How flagella helps in iocomotion of organisms ? Why outer membrane of gram negative bacteria is considered as 2nd biological membrane ? $6 + 6 + 3$
10. Briefly describe the steps of endospore formation in gram positive bacteria. What is the difference between endospore and exospore ? What are the steps needed for endospore germination to form vegetative cells. $7 + 3 + 5$
11. What do you mean by junctional complex ? Describe briefly about the different types of junctional complex present. What is plasmodesmata ? Write short notes on (a) the structure of nucleus and (b) microvilli. $2 + 5 + 2 + (3 + 3)$