

[This question paper contains 4 printed pages.]

998

Your Roll No. ....

**B.Sc. (Hons.) / III**

**C**

**BIOCHEMISTRY – Paper XIV**

**(Cell Biology)**

**(Admissions of 2000 and onwards)**

*Time : 3 hours*

*Maximum Marks :*

*(Write your Roll No. on the top immediately  
on receipt of this question paper.)*

*Attempt five questions in all, including  
Question No. 1, which is compulsory.*

1. State True and False. Reason out your answers :
  - (a) MPF can move the cell cycle from G1 to S phase.
  - (b) Meiotic arrests are observed at diplotene and metaphase II stage of developing mammalian ova.
  - (c) Treadmilling helps to maintain the length of the intermediate filaments.
  - (d) Kinesin and myosin are similar motor proteins.

P.T.O.

- (e) Tumor suppressor genes are the dominant genes.
- (f) Ran GTP is maintained in a high concentration in nucleus.
- (g) The lumen of the ER is like the exterior of the cell.
- (h) COPI vesicles transport proteins from ER to golgi apparatus. (2×8=16)
2. (a) What kind of signals determine selective trafficking of molecules to and from the nucleus? Explain different kinds of NLS. (5.5)
- (b) Discuss peroxisome assembly with reference to Pex3 and Pex19. What causes zellweger syndrome? (5.5)
3. (a) Compare and contrast microfilaments, intermediate filaments and microtubules. (6)
- (b) Give the structure of cilia. Give the mechanism of ciliary movement. (5)
4. Differentiate between the following :
- (a) Oncogene and Tumor Suppressor Gene
- (b) Kinesin and dyenin

- (c) Desmosomes and Hemidesmosomes (4,3,4)
5. (a) Give the characteristics of the cancer cells. (5)
- (b) Give the mechanism of action of following chemotherapeutic drugs :
- (i) Gefitinib
  - (ii) Gleevec
  - (iii) Imatinib (2×3=6)
6. (a) How is protein transport mechanism in chloroplast similar to mitochondria ? (3)
- (b) What is apoptosis ? Differentiate between extrinsic and intrinsic pathways of apoptosis. (6)
- (c) Draw a well labeled diagram of the structure of Nuclear pore complex. (2)
7. Write short notes on :
- (a) G1 checkpoint
  - (b) rRNA synthesis and processing
  - (c) Targetting of proteins to lysosomes (4,4,3)

8. (a) Mention the role of following proteins in the cell (any **four**):

- (i) ATM kinase
- (ii) Wee 1 kinase
- (iii) Titin
- (iv) Profilin
- (v) Formin
- (vi) SNARE (2×4)

(b) How does the cell ensure that replication of DNA happens only once per cell cycle? (3)