

**MOTILAL NEHRU NATIONAL INSTITUTE OF TECHNOLOGY
ALLAHABAD**

**END SEMESTER (ODD) EXAMINATION 2018-19
BACHELOR OF TECHNOLOGY, BIOTECHNOLOGY
IIIrd SEMESTER, BT-1303: CELL AND SYSTEM BIOLOGY**

Date: 08.12.2018. Time: 02:30 - 5:30 pm

Time: 03:00 h

Marks: 60

Attempt all questions.

✓ Q1. Describe structure and function of epithelial system? List various types of epithelial tissue in animals? [3]

Q2. Discuss in detail the molecular drivers of evolution. Cite example wherever required? [5]

Q3. Differentiate between ANY FOUR of the following [4x4=16]

- A Right Ventricle and Left Ventricle
- B Mitosis and Meiosis
- C Glycosomes and Lysosomes
- ✓ D Oncogenes and Tumor suppressor genes
- ✓ E Chloroplast and Mitochondria
- F M cyclin-CDK and S cyclin-CDK complexes

✓ Q4. Describe structure and signalling function of β -Adrenergic, G-Protein Coupled Receptors? How epinephrine activates its function? [5]

Q5. Describe different movements across the cell membrane? [3]

Q6. Write Short notes on ANY FOUR of the following [4x2.5=10]

- A Eukaryotic Ribosomes
- ✓ B Desmosomes
- ✓ C Apoptosis
- ✓ D Cyclins
- E Cellular compartmentalization
- ✓ F AIDS

Q7. Describe structure and function of Golgi apparatus? [3]

Q8 Answer ANY TEN of the following very briefly [10]

- A Which protein filaments are responsible for attaching to chromosomal centromeres and pulling apart DNA during mitosis?
- B Name any two intracellular secondary messengers in cell signalling?
- C Name the protein(s) involved in chromosomal organization?
- D In which phase of cell cycle, DNA is replicated?
- E List the three major cytoskeletal components in order from the smallest to the largest?
- F What are cancers of epithelial and connective tissue called?
- G How Adrenaline controls the heart rate?
- H Which two myogenic nodes initiate the muscle contraction of heart muscle fibre at the start of heart contraction relaxation cycle?
- I When a cell undergoes irreparable DNA damage, what the cell does to stop it?
- J Write any two functions of Rough Endoplasmic Reticulum (RER)?
- K What are benign tumors?
- L Name any two phospholipids of cell membrane

Q9 Draw a neat diagram to depict the cell cycle. Point out the timings of most important cell cycle checkpoints in the diagram as well.

[2.5]

Q10 Fill in the blanks.

[2.5]

- A provides rigidity to the cell membrane.
- B is called the "powerhouse of cell"
- C Insulin binds to Insulin receptor, which is a type of
- D have no membrane bound organelles.
- E binds to separase protein and inhibits the segregation of chromosomes until start of anaphase during mitosis