

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All** questions carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q.1 a. Explain the following terms: (Any six) 06

1. Checkpoints.
2. Cdk.
3. Mitogens.
4. Fission yeast.
5. Cell proliferation.
6. Scramblase.
7. Caspases.
8. Apoptotic bodies.
9. Temperature sensitive mutants.

Q.1 b. Answer the following questions: (Any Two) 14

1. Describe the various phases of Eukaryotic cell cycle.
2. Explain the Extrinsic pathway of Apoptosis.
3. With reference to role of MPF embryonic cell cycle discuss
 - a. MPF- cytoplasmic regulator.
 - b. Cyclin Accumulation and Destruction Control the Activation and Inactivation of MPF.

Q.2 a. Do as instructed: (Any six) 06

1. What are connecting weights?
2. What do you mean by autocrine signalling?
3. State the significance of signal termination.
4. State the significance of a “hidden layer”.

5. Fill in the blank: Inhibition of adenylyl cyclase would result in a decrease in the concentration of _____ levels.
(adenosine, cyclins, cyclic adenosine monophosphate)
6. Give an example of a ligand.
7. Give one example of a growth factor.
8. State true or false: Computer-based networks were originally developed to understand how nerve cells relay and process information in the brain.
9. State true or false: IP_3 is a second messenger.

Q.2 b. Explain the following questions: (Any Two) 14

1. General principles of cell signalling.
2. Mechanism of target cell adaptation.
3. Signal transduction pathway of receptor tyrosine kinases with a diagram.

Q.3 a. Do as directed: (Any Six) 06

1. What is developmental biology?
2. State true or false: - Descriptive embryology is one of the phases emerged in the era of Modern developmental biology.
3. Fill in the blank: - The fertilized egg cell is also called a ----- . (gamete, zygote, blastula, morula)
4. Define Cellular differentiation.
5. Give any one derivative of ectoderm germ layer.
6. What is mosaic development?
7. Define Gastrulation.
8. Any one example of a cytoplasmic determinant that influence the fate of daughter cells.
9. What is pattern formation in developmental biology?

Q.3 b. Discuss the following: (Any Two)

14

1. Significance of Model organisms in study of developmental biology with a suitable example.
2. Morphogen– meaning and various types of morphogenetic movements.
3. Fate maps- meaning, construction and uses.

Q.4 a. Explain the following: (Any six)

06

1. Neoplasm.
2. Angiogenesis.
3. Proto-oncogenes.
4. Tumour progression.
5. Leukemia.
6. Ras protein.
7. Melanoma.
8. Retinoblastoma.
9. CA-125.

Q.4 b. Attempt the following questions: (Any Two)

14

1. Discuss with a suitable example- Cancer cells are clones descended from a single abnormal cell.
2. Elaborate on the role of p53 gene in cancer.
3. Explain the role of viruses in cancer.

Q.5 Write Short notes on the following (Any four)

20

- a. Apoptosis and its process.
- b. Prokaryotic cell cycle.
- c. Bacterial chemotaxis.
- d. Embryonic stem cells- concept and importance.
- e. Replicative senescence.
- f. Chemotherapy of cancer.