

- N.B.** (1) **All five** questions are **compulsory**.
 (2) **All** questions carry **equal** marks.
 (3) Illustrate wherever **necessary**.

- Q1. Explain how failure of cell cycle regulation would lead to cancer ? **12**
OR
 Q1. Describe the various aspects of cell organization during cell division. **12**
- Q2. Describe any three DNA repair mechanisms in detail. **12**
OR
 Q2. (a) Discuss the differences between cancer cells and normal cells. **6**
 (b) Describe autophagic cell death mechanism and state its significance. **6**
- Q3.(a) Describe the phenomenon of chromosomal inheritance in fission yeast. **6**
 (b) Describe the process of DNA demethylation and discuss its effect on gene regulation. **6**
OR
- Q3. Describe the mechanism of chromatin remodeling. Write a brief account of the diseases associated with defects in chromatin remodeling. **12**
- Q4. Describe in detail DNA Microarrays. What are their applications in biological research ? **12**
OR
- Q4. (a) What is Fluorescence ? What is the mechanism of FRET ? **6**
 (b) How are gene knockdowns created ? State their applications. **6**
- Q5. Write short notes on any **three** of the following :— **12**
 (a) Cyclins
 (b) Apoptosis proteins – Bax and Bak
 (c) Restriction point and START
 (d) Chemical carcinogenesis
 (e) Flow Cytometer : instrument overview
 (f) Slicer.