

2074

**B.E. (Biotechnology) Third Semester  
BIO-314: Cell Biology and Genetics**

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

**1. Write very short answer to followings**

(1\*10=10)

- a. What does ddATP stand for in its full form?
- b. What is the primary protein found in cilia and flagella?
- c. What is Arm ratio?
- d. Which amino acids are predominant in histone proteins?
- e. Nucleosides serve as the fundamental building blocks of which molecule?
- f. What are two distinguishing characteristics of heterochromatin?
- g. At which stage does the cell plate appear in plant cell division?
- h. What is the phenotypic ratio in the F<sub>2</sub> generation when codominance is observed?
- i. What is the genotype associated with Down syndrome?
- j. What type of inheritance pattern is associated with the transmission of human mitochondria?

**Section-A**

2. Describe in detail hierarchy of chromosomal packing of DNA. (draw labelled diagrams) (10)
3. a) Give structural and functional details of plasma membrane. (5)  
b) Write a detailed note on membrane proteins. (5)
4. a) Differentiate between microtubules and intermediate filaments. (5)  
b) Write a note on (Any one) (5)  
I. Structure and function of polytene chromosome  
II. CDKs activation

**Section-B**

5. a) Provide the genotypic, phenotypic and structural characteristics of three significant chromosomal abnormalities. (5)  
b) Write a detailed note on retro-transposons. (5)
6. a) Draw F<sub>1</sub> and F<sub>2</sub> ratio of dominant and co-dominant epistasis phenomena of inheritance, taking one example each. (7)  
b) How phenomena of epistasis differ from pleiotropy. (3)
7. a) Taking an example, explain how genetic linkage are employed in genetic mapping? (5)  
b) Write a note on followings (Any one) (5)  
i) Chromosome banding  
ii) Cot curve

x-x-x