2025

M.Sc. 3rd Semester Examination

BOTANY

Paper : BOT - 301

(Cell Biology and Genetics)

(New Syllabus)

Full Marks : 25 Time : Two Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group - A

Answer any ***two*** questions : 2×2=4

1. Explain with examples why and how maternal effect is seen in all instances of extranuclear inheritance.

2. What does the equation $p^2 + 2pq + q^2 = 1$ represent in population genetics?

3. Express how p53 gene is implicated in cell cycle regulation.

4. How the parental type, single cross over and double cross over type individuals are identified in an unknown population on the basis of character combination found in them?

P.T.O.

Group - B

Answer any *two* questions : 4×2=8

5. Give a brief account of the ultrastructural features of nucleolus along with their respective functional significance.

6. Mention the diverse nature of polygenic inheritance. Explain infectious heredity with the aid of inheritance of kappa bearing in paramecium. 1+3

7. How does transposase act? How is Barrbody related to Lyon hypothesis? 1+3

8. What makes a newly developed population to have a founder effect different from the earlier population? Explain how allele frequency gets affected by this process. 2+2

Group - C

Answer any *one* question : 8×1=8

9. Elucidate the roles of different cyclins and cdks in different stages of cell cycle.

10. Briefly describe the specific nature of wrapping of DNA on histone octamer of nucleosome.

Internal Assessment : 5 marks