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PG/3rd Sem/BOT/25(Old)

2025

M.Sc. 3rd Semester Examination

BOTANY

Paper : BOT - 301

(Old 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.*

Paper : BOT - 301.1

(Cell Biology and Genetics)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What is maternal inheritance?
2. Briefly mention the different parts of a nucleus.
3. Mention the role of p53 gene 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.

(2)

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Describe the ultrastructural features of nucleolus mentioning the functions of different parts.
6. Mention the different kinds of polygenic inheritance. Explain infectious heredity citing the example of inheritance of kappa bearing in paramecium. $1+3$
7. How does transposase act? Illustrate the structural and functional nature of Ac/Ds elements. $1+3$
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 : $8 \times 1 = 8$

9. Give a comprehensive account of the roles of different cyclins and cdks in different states of cell cycle.
10. How does DNA and histone protein constitute nucleosome?

Internal Assessment : 5 marks

(3)

Paper : BOT - 301.2

(Biotechnology)

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. How lac z gene used as marker in genetic engineering?
2. How is cDNA library constructed?
3. Name the essential elements required for plasmid vector used in genetic engineering.
4. Explain footprint of transposition and its significance.

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. How do variable number tandem repeat (VNTR) help in identification of individual?
6. What are propeller twist and twist angle in a DNA molecule?
7. Characterize phagemid and comment on its utility.
8. Explain transgressive inheritance. Why plant introduction is considered a method of plant breeding? $2+2$

P.T.O.

(4)

Group - C

Answer any *one* question : 8×1=8

9. What is Pure Line variety? Mention the procedure of developing Pure Line variety and state the genetic basis of purity. 2+6
10. What is cybrid? Mention the procedure for liberating plant protoplast for culture, precautions to be taken and testing the viability of protoplast. 2+6

Internal Assessment : 5 marks
