

BOTANY (Optional)**वनस्पतीशास्त्र (वैकल्पिक)****Time : 3 hours****Maximum Marks : 200****Note :**

- (i) In all attempt **Five** questions.
- (ii) Question No. 1 is **compulsory**.
- (iii) Of the remaining Questions, Attempt **Any four** by selecting **one question** from each section.
- (iv) Number of optional questions upto the prescribed number in the order in which questions have been solved, will only be assessed and excess answers of the question/s will not be assessed.
- (v) Candidate should not write roll number, any names (including his/her own), signature, address or any indication of his/her identity anywhere inside the answer book otherwise he/she will be penalised.

1. Answer **any four** of the following questions : 40
 - (a) What is coding dictionary ? Discuss in brief its salient features.
 - (b) What is Geologic Time Scale ? Write in brief about palaeoenvironment and flora of each era. (Tabular form may be given)
 - (c) Define "Sterilization". Describe the methods of sterilization commonly used in microbiology and tissue culture laboratory. (Illustrations may be given)
 - (d) What are plant growth regulators ? Give role and functions of Gibberellins in plant growth and development.
 - (e) Define gene cloning. Give a general protocol for generation of a recombinant DNA and obtaining copies of gene-of-interest (GOI). (Graphic presentation expected)

SECTION - A

2. Answer the following questions :
 - (a) Compare the structure of a generalized plant cell with that of a bacterial cell with the help of fully labeled diagrams. Point out the important structural and functional differences between the two. 20
 - (b) What is chromosomal mapping ? Describe the three-point-test-cross method with a suitable example. 20

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3. Answer the following questions :

- (a) Define standard deviation and coefficient of variation. Find out the SD and COV for the given data. (Use "machine formula" for calculator) 20

Problem : Given below is the weight in grams (g) of the rice grains.

Sample (I)	Sample (II)
X_i (g)	X_i (g)
1.2	1.2
1.4	1.6
1.6	1.7
1.8	1.8
2.0	1.9
2.2	2.0
2.4	2.4
$\Sigma x_i = 12.6$ g	$\Sigma x_i = 12.6$ g

- (b) Define the term "tissue". How do primary and secondary tissues originate in a dicot stem ? Illustrate your answer with suitable labeled diagrams. 20

SECTION - B

4. Answer the following questions :

- (a) Give general characters of Bryophytes. Compare the sporogonium of Anthocerotopsida with that of Bryopsida (diagrams expected). 20
- (b) Define "Heterospory" and "Seed Habit". How was Seed Habit developed (causes of evolution of Seed Habit). 20

5. Answer the following questions :

- (a) What is Botanical Nomenclature ? Explain in brief the rules and principles of botanical nomenclature with suitable examples. 20
- (b) Define pollination. Give different types and mechanism and contrivances for cross pollination. 20

SECTION - C

6. Answer the following questions :
- (a) Viruses are "knocking the door of life". Justify. Describe the ultrastructure of Tobacco-Mosaic-Virus (TMV) with the help of suitable diagrams. 20
- (b) What do you understand by "plant water relations" ? Describe the role of diffusion, osmosis and water potential in plasmolysis and deplasmolysis (illustrate your answer with suitable diagrams). 20
7. Answer the following questions :
- (a) Give a comparative account of CO₂ - fixation in C₃ and C₄ plants (Graphical illustrations enough). Add a note on significance of C₄ pathway. 20
- (b) What is photoperiodism ? Describe its role in induction of flowering. Compare Short-day plants with Long-day plants according to their photoperiodic requirement for flowering. 20

SECTION - D

8. Answer the following questions :
- (a) Define plant succession. Describe the process of primary succession on barrens rock/bare ground (diagrammatic presentation expected). 20
- (b) Define soil erosion. Describe in brief the role of deforestation and desertification, and reforestation and social forestry in soil erosion. 20
9. Answer the following questions :
- (a) Enlist at *least two* examples *each* of the forest plants being used (along with their parts), as : 20
 (i) fibres, (ii) wood and timber, (iii) rubber, (iv) beverages, (v) narcotics, (vi) spices, (vii) resins, (viii) dyes, (ix) insecticides and (x) ornamentals
- (b) Define plant tissue culture. How is it used for somatic embryogenesis. 20