

M.Sc. (Part-I) Semester-II (CBCS Scheme) Examination
BOTANY
(Cytogenetics and Molecular Biology)
Paper-V

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) All questions are compulsory and carry equal marks.

(2) Diagrams/sketches should be given wherever necessary.

(3) Illustrate your answer with well labelled diagrams and examples wherever necessary.

(4) Simple calculator is allowed. Scientific calculator is not allowed.

1. (a) What is polyploidy ? Explain in detail the application of polyploidy in crop improvement. 8
(b) Describe in detail male sterility and compare with cytoplasmic male sterility. 8

OR

Describe in detail breeding methods for self pollinated plants. Add a note on merits and demerits. 16

2. (c) Cot curve and C-value paradox. 8
(d) Multigene families. 8

OR

In a test cross following progeny was obtained :

σ^7	Q	
<u>A B C</u>	<u>a b c</u>	
<u>A B C</u>	<u>a b c</u>	
ABC/abc	—	349
abc/abc	—	360
aBC/aBc	—	4
Abc/abc	—	114
AbC/abc	—	5
aBC/abc	—	116
abC/abc	—	124
ABc/abc	—	128

Find out the correct sequence of the genes, construct map and find out coefficient of coincidence and interference. 16

3. (e) Comment on the role of transcription factors. 5
(f) Discuss yeast artificial vectors. 5
(g) Explain in brief mechanism of RNA splicing. 6

OR

- (h) Homeobox. 5
- (i) Fine structure of gene. 5
- (j) Molecular mechanism of crossing over. 6
- 4. (k) AFLP as molecular markers. 5
- (l) Explain the method of DNA fingerprinting. 5
- (m) Restriction and map construction. 6

OR

- (n) How restriction enzymes are useful for genome editing. 5
- (o) What are molecular markers ? Explain in brief RAPD. 5
- (p) What is blotting ? Explain Southern hybridization. 6
- 5. (q) Maxam and Gilbert's technique. 5
- (r) Mean and Mode. 5
- (s) Explain the role of computers in Life Sciences. 6

OR

- (t) Sangar's method. 5
- (u) Chi-square test. 5
- (v) Databases. 6