PG/IIIS/BOT/301.1 & 301.2/23
(Old)

M.Sc. 3rd Semester Examination, 2023

BOTANY

PAPER—301(Old)

Full Marks : 50

Time : 2 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

PAPER—BOT-301.1

(*Cell Biology & Genetics*)

GROUP – A

Answer any **two** from the following : 2×2

1. What is linkage group ? What would be the number of it in a tetraploid individual with 24 chromosomes ?

2. What is the nature of gene interaction and principle of that for a inheritance pattern of 9 : 3 : 4 of a trait ?

3. Why is kappa particle of *Paramoecium* related to infectious heredity ?

4. What is a "Barr body" in the mammals ? State the significance of such formation.

GROUP – B

Answer any **two** of the following : 4×2

5. Illustrate how does Hardy Weinberg principle explain the constancy of allele frequency and genotypic frequency of a population ? State the conditions under which it works. $3 + 1$

6. Briefly describe the construction of IS element and how can it jump at different sites in a genome. $2 + 2$

7. Why is three point test cross required for chromosome mapping with the help of crossover products ?

8. How do the different histone proteins construct the carnal of a nucleosome and the entire structure ?

GROUP – C

Answer any **one** question of the following : 8×1

9. Briefly describe the different phases of cell cycle, check points and their molecular mechanism of regulation. $4 + 4$

10. Illustrate the nature of maternal inheritance with suitable examples. How does it differ from organeller inheritance ? $7 + 1$

PAPER–BOT-301.2

(Biotechnology)

GROUP – A

Answer any **two** questions of the following : 2×2

11. Name two most essential elements for constructing artificial chromosomes. Why are those elements are needed ?

12. How can a cell/tissue carrying recombinant DNA be sorted out ?

13. Which one of cDNA library and genomic library will be chosen for finding out any gene of interest and how is it done ?

14. Define xylogenesis in plant callus culture and state its significance.

GROUP – B

Answer any **two** of the following : 4×2

15. Illustrate how does Hardy Weinberg principle explain the constancy of allele frequency and genotypic frequency of a population ? State the conditions under which it works ? 3 + 1

16. Briefly describe the construction of IS element and how can it jump at different sites in a genome. 2 + 2

17. Why is three point test cross required for chromosome mapping with the help of crossover products ?

18. How do the different histone proteins construct the carnal of a nucleosome and the entire structure ?

GROUP – C

Answer any **one** of the following : 8×1

19. Briefly describe the procedure and uses of callus culture of plant tissues. 8

20. Write down how plant introduction can be a part of plant breeding contributing in multiple ways. Why can introduce plant in a country ? Mention its demerits. $4 + 2 + 2$

[Internal Assessment – 10 Marks]