

# **KAMARAJ COLLEGE (Autonomous)**

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

**(5 Pages)**

**Reg. No: .....**

**Question Code No: 25003502**

**Sub Code: 24PMB032**

**PG Degree - End Semester Examinations, November 2025**

**Third Semester**

**M.Sc. BOTANY**

**Genetics, Plant Breeding & Biostatistics**

**(For those who joined in July 2024 onwards)**

**Time : 3 Hours**

**Maximum: 75 Marks**

**PART- A (10 × 1 = 10 Marks)**

**Answer ALL Questions**

**Choose the correct answer:**

1. Which of the following is the ratio of dominant epistasis?

(a) 9:3:4

(b) 9:7

(c) 12:3:1

(d) 15:1

2. Sex determination was first studied in which plants?

(a) *Rumex*

(b) *Datura*

(c) *Melandrium*

(d) *Mirabilis*

3. Who proposed holiday model for homologous recombination?
- (a) Gobind Khurana                      (b) Louis Pasteur  
(c) Robin Holiday                      (d) Niels Bohr
4. The enzyme that catalyses the transposition of an IS element is called \_\_\_\_\_
- (a) Transposase                      (b) Integrase  
(c) Trascriptase                      (d) Polymerase
5. Inheritance of ABO blood group system is an example of \_\_\_\_\_
- (a) Dominance                      (b) Epistasis  
(c) Partial dominance                      (d) Multiple allele
6. Which one of the following has its own DNA?
- (a) Mitochondira                      (b) Dictyosome  
(c) Lysosome                      (d) Peroxisome
7. A crop showing less than 5 % cross pollination is considered as \_\_\_\_\_
- (a) Cross pollinated crop                      (b) Often cross pollinated crop  
(c) Self-pollinated crop                      (d) Often self-pollinated crop

8. The geitonogamy condition is found among which of the following crop?
- (a) Maize (b) Wheat  
(c) Pigeonpea (d) Papaya
9. Which of the following represent the most frequently occurring value in a data set?
- (a) Mean (b) Median  
(c) Mode (d) All of these
10. The test used for correlation significance is \_\_\_\_\_
- (a) T-test (b) Chi-square test  
(c) ANOVA (d) Z-test

**PART - B (5 X 5 = 25 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 250 words.**

11. (a) Explain the incomplete dominance.

**(OR)**

- (b) Describe Britten and Davidson model of eukaryotic gene regulation.

12. (a) Distinguish homologous and non-homologous recombination of chromosomes.

**(OR)**

(b) Comment on site directed mutagenesis.

13. (a) Write short note on linkage map.

**(OR)**

(b) List out the functions of chloroplast DNA.

14. (a) Describe methods of pure line selection and its advantages.

**(OR)**

(b) Summarize the important varieties produced in mutation breeding.

15. (a) Briefly explain the mean, median and mode.

**(OR)**

(b) Write a short note on Chi-square test.

**PART - C (5 X 8 = 40 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 600 words.**

16. (a) Describe the Mendal's law of independent assortment with suitable example.

**(OR)**

(b) Explain the Lac operon model of gene regulation in prokaryotes.

17. (a) Write a detailed account on transposable genetic elements.

**(OR)**

(b) Give an account of Mismatch DNA repair mechanism.

18. (a) Enumerate the ABO blood group in humans.

**(OR)**

(b) Discuss the Extrachromosomal inheritance.

19. (a) Enlist the characteristics improved by cross pollinated crops.

**(OR)**

(b) Describe the steps involved in hybridization techniques.

20. (a) Explain in detail about one-way ANOVA.

**(OR)**

(b) Discuss the significance of regression and correlation.