LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

FIFTH SEMESTER – **APRIL 2023**

UPB 5502 – GENETICS AND PLANT BREEDING

Date: 03-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART-A

Answer the following, each within 50 words. **(10 × 2 = 20 marks)**

1. Define gene.
2. State the law of Independent assortment.
3. What are complementary genes?
4. Comment on bleeder's disease.
5. Indicate the role of kornberg enzyme in DNA replication.
6. Define cistron.
7. State Hardy-Weinberg law.
8. What is a transposon?
9. State importance of domestication.
10. What is emasculation?

PART-B

Answer the following, each within 500 words. Draw diagrams and flowcharts wherever necessary **(5 × 7 = 35 marks)**

11. a. Discuss the history of scientific developments in the field of genetics.

(or)

b. Explain the following: i) pleiotropism ii) lethal genes

12. a. Elaborate on the concept of maternal inheritance with examples.

(or)

b. Write notes on polygenic inheritance.

13. a. Elucidate the structure and functions of tRNA.

(or)

b. Explain the mode of gene regulation of *lac* operon with a neat illustration.

14. a. Discuss the types of structural aberrations in chromosomes.

(or)

b. Interpret any two repair mechanisms of DNA.

15. a. Explain the various steps involved in hybridization of plants in crop improvement.

(or)

b. Define polyploidy. Explain the role of polyploidy in plant breeding.

PART- C

Answer any three of the following, each answer within 1200 words. Draw diagrams and flowcharts wherever necessary **(3 × 15 =45 marks)**

16. Discuss in detail the modified monohybrid ratios with examples.
17. Analyze the mechanism of linkage and crossing over.
18. Describe the process of protein synthesis in prokaryotes.
19. Write in detail the concept of mutation and its types.
20. Explain the different selection methods in crop improvement.

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