

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086**  
**(For Candidates admitted during the academic year 2019 – 2020 & thereafter)**

**B.Sc. DEGREE EXAMINATION - NOVEMBER 2024**  
**BRANCH VI A – ADVANCED ZOOLOGY & BIOTECHNOLOGY**  
**FIFTH SEMESTER**

**COURSE : MAJOR CORE**  
**PAPER : GENETICS**  
**SUBJECT CODE : 19ZL/MC/GN54**  
**TIME : 3 HOURS** **MAX. MARKS: 100**

**SECTION – A**

**ANSWER ALL THE QUESTIONS** **(10 x 3 = 30)**

1. Tabulate any three differences between qualitative and quantitative traits.
2. Define the following:
  - a. Multiple alleles
  - b. Eugenics
  - c. Phenocopy
3. Differentiate between the following:
  - a. Epistasis and Dominance
  - b. Test Cross and Back Cross
4. Mention the characteristic features of the following:
  - a. Martin-Bell Syndrome
  - b. Y-linked inheritance
  - c. Frameshift Mutation
5. Give an example for each of the following:
  - a. Lethal genes
  - b. Sex-limited genes in man
  - c. Variable expressivity
6. Classify mutagens with an example for each.
7. What is the significance of the Rh Factor?
8. Comment on transgressive variation.
9. Name the three groups of segmentation genes and indicate how they are related to each other.
10. What are the following?
  - a. Inbreeding depression
  - b. Endopolyploidy

**SECTION – B**

**ANSWER ANY FIVE QUESTIONS** **(5 x 6=30)**

11. Write a short note on the monohybrid cross performed by Mendel and highlight the concepts that emerged from these experiments.
12. Illustrate maternal inheritance with an example.
13. Explain the mechanism of sex determination in *Drosophila*.
14. Describe any two chromosomal aberrations in the context of structural variations.
15. Give a brief account of Genetic Counseling and its applications.
16. Justify the significance of *ex-situ* conservation.
17. Briefly discuss various epigenetic alterations that are associated with ageing and cancer.

ANSWER ANY TWO QUESTIONS

(2 x20=40)

18. Describe linkage and crossing over in *Drosophila*.
19. Explain Hardy Weinberg Law and discuss the factors influencing allele frequency.
20. Discuss the phenomenon of co-dominance and incomplete dominance with suitable examples.
21. Explain the three important diseases associated with metabolic breakdown of phenylalanine.

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