(Pages : 4) **M – 1512**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2021

First Degree Programme under CBCSS

Botany

Core Course

BO 1543 – CELL BIOLOGY, GENETICS AND EVOLUTIONARY BIOLOGY

(2018 Admission)

Time : 3 Hours Max. Marks : 80

Instruction: Draw diagrams wherever necessary

SECTION – A

I. Answer **all** questions in one word to two sentences. Each question carries **1** mark:

1. What provides stability for the natural ends of chromosomes?

2. Who proposed the mutation theory of evolution?

3. What are sex chromosomes?

4. What is crossing over?

5. What is a genetic map?

6. Define microevolution.

P.T.O.

7. What is a two-point test cross?

8. What is back cross?

9. What is the function of lysosomes?

10. What is founder effect?

(10 × 1 = 10 Marks)

SECTION – B

II. Answer any **eight** questions; not to exceed a paragraph. Each question carries **2** marks:

11. How does meiosis contribute to genetic recombination?

12. What is the role of peroxisomes in plants?

13. What is polygenic inheritance? Give one example.

14. Differentiate between gene and allele.

15. Why is mitosis an equational division?

16. How can the concept of recombination frequency be used in genetic mapping?

17. Why are hemophilic women rare?

18. Differentiate between progressive evolution and retrogressive evolution.

19. What is coil cycle? Describe the different phases in mitotic cell cycle.

20. Explain the cause and common symptoms of Turner's syndrome.

21. Why was Mendel successful in genetic studies?

22. What is maternal effect? Give one example.

23. Comment on different types of aneuploids that accounts for various chromosomal disorders in humans.

24. Explain the major significance of mitosis?

25. Name the plant in which Mendel carried out his studies. What were the advantages of this plant in genetic studies?

26. Explain the role of polyploidy in evolution.

(8 × 2 = 16 Marks)

SECTION – C

III. Answer any **six** questions; not to exceed 120 words. Each question carries **4** marks:

27. 'Linked genes violate the law of independent assortment.' Substantiate the statement.

28. Describe the genetics of the blood types in human beings.

29. Comment on the significance of mutation as an important force of evolution.

30. Describe how bottleneck effect and founder effect are responsible for genetic drift

31. Explain heterogametic sex determination giving suitable examples.

32. Write a brief account on special types of chromosomes.

33. Describe the sex determination mechanism found in *Melendrium album*.

34. Explain Lamarckism and give evidences for it.

35. Describe the genetics behind the inheritance of fruit color in summer squash.

36. Explain the inheritance pattern of a duplicate gene with cumulative effect, citing an example.

37. What is the difference between euploidy and aneuploidy? Give examples for both.

38. Explain Weisman theory on evolution.

(6 × 4 = 24 Marks)

SECTION – D

IV. Write essay on any **two** of the following, not more than **3** pages. Each question carries **15** marks:

39. What is extrachromosomal inheritance? Explain quoting suitable examples.

40. Write an essay on the various types of chromosomal aberrations.

41. Write an account on the important postulates of Darwinism. Add a note on Neo-Darwinism.

42. Explain sex linked inheritance with reference to eye colour in Drosophila and haemophilia in man.

43. Explain sex chromosomal abnormalities in man, citing suitable examples.

44. Describe in detail, the organization of eukaryotic chromosomes.

(2 × 15 = 30 Marks)

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