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Name.....................................

Reg. No.................................

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Genetics

GEN 4B 04—CYTOGENETICS AND EVOLUTIONARY GENETICS

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all the **ten** *questions in a word* **or** *phrases.*
Each question carries 1 mark.

1. Define chromosome.

2. Mention any two structural chromosomal aberrations.

3. What is linkage ?

4. Define crossing over.

5. What is maternal inheritance ?

6. Define allele frequency.

7. Define gene pool.

8. Define mutation.

9. Define speciation.

10. Define genetic variation.

(10 × 1 = 10 marks)

Section B

Give Short Answer to any **ten** *out of twelve questions.*
Each question carries 2 marks.

11. What is an isochromosome ?

12. Define heterochromatin.

13. Distinguish between pericentric and paracentric inversion.

14. Define karyotyping.

15. Define recombination frequency.

16. Distinguish between homologous and non-homologous recombination.

17. What is a linkage group ?

Turn over

18. How is chloroplast DNA inherited ?

19. What is allopatric speciation ?

20. What causes speciation ?

21. Define quantum sipeciation.

22. What is assortative mating ?

(10 × 2 = 20 marks)

Section C

Answer in **a paragraph** *to any* **five** *out of eight questions.*
Each question carries 6 marks.

23. Write short note on the classification of chromosomes based on centromere position.

24. Write an account on tetrad analysis.

25. Distinguish between chromosomal deletions and duplications.

26. Give an account on different types of linkages.

27. Explain briefly about the factors that affects Hardy Weinberg equilibrium.

28. Discuss does non-random mating increase genetic variation.

29. What are the three types of reproductive isolation ?

30. Explain the difference between geographic and reproductive isolation.

(5 × 6 = 30 marks)

Section D

Write essays on any **two** *questions.*
Each question carries 10 marks.

31. Write an account on the numerical changes in chromosomes.

32. Give a detailed account on genetic linkage and it is significance in genetic mapping.

33. Give a detailed account on mitochondrial inheritance with suitable examples.

34. Explain the species concept with an example.

(2 × 10 = 20 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION APRIL 2021

Genetics

GEN 4B 05—CYTOGENETICS AND EVOLUTIONARY GENETICS

Time : Two Hours   Maximum : 60 Marks

Section A

*Answer at least **eight** questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Describe gene pool.

2. What is genetic drift and which are the types ?

3. What are species concepts ?

4. What is relative allelic frequency ?

5. What is founder effect ?

6. Describe crossing over ?

7. What is maternal inheritance ?

8. What is complete Linkage ?

9. What is a petite mutant ?

10. What is uniparental inheritance ?

11. Define mitochondrial inheritance.

12. What is Interference ?

(8 × 3 = 24 marks)

Turn over

Section B (Short Essay Questions)

Answer at least **five** *questions.*
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. Describe artificial selection.

14. What are the theories of hybrid vigor.

15. Write note on genetic variations in natural populations.

16. What is allelic frequency and how does mutation affect it ?

17. Explain phenotypic variations and its causes.

18. Explain how chloroplasts are inherited ?

19. Explain tetrad analysis with reference to Neurospora.

(5 × 5 = 25 marks)

Section C (Essay Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. Describe Hardy-Weinberg law and explain its applications.

21. Describe in detail the pattern of extra-nuclear inheritance with special reference to leaf variegation in *Mirabilis* jalapa.

(1 × 11 = 11 marks)