C 21529 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Genetics

GEN4B05—CYTOGENETICS AND EVOLUTIONARY GENETICS

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A

Answer atleast **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall ceiling 24.

1. What is quantitative genetics ?
2. What is a Linkage map ?
3. What is founder effect ? Explain its significance.
4. Define recombination frequency.
5. Define centiMorgan.
6. Define three-point test cross.
7. What are the salient features of crossing over ?
8. Define mitotic recombination.
9. Describe maternal inheritance.
10. Describe fine structure mapping.
11. Describe chromosome mapping.
12. Describe chloroplast inheritance.

(8 × 3 = 24 marks)

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Section B

Answer atleast **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall ceiling 25.

13. Explain broad sense heritability and narrow sense heritability and their importance in the field of animal and plant breeding.

14. Give the examples of utilizing hybrid vigour in plant and animal breeding.

15. Describe how selection coefficient can be calculated in a population.

16. Explain additive alleles and its implications in breeding and genetics.

17. Give a detailed account on Poky mutant and its inheritance pattern.

18. What is the effect of recombination in evolution ?

19. Describe tetrad analysis with reference to Neurospora.

(5 × 5 = 25 marks)

Section C

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

20. Explain genetic mapping with the help of two point and three-point test cross.

21. Describe in detail about mitochondrial and chloroplast inheritance pattern.

(1 × 11 = 11 marks)

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C 21277 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Genetics

GEN 4B 04—CYTOGENETICS AND EVOLUTIONARY GENETICS

(2014—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

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

1. What is a Chromatid ?
2. What do you mean by coupling phase linkage ?
3. State the use of tetrad analysis.
4. What do you mean by maternal inheritance ?
5. What is the gene pool of each population ?
6. What you call the movement of genetic diversity, usually within a species ?
7. Is sympatric speciation constrained by gene flow ?
8. Chromosome maps/ genetic maps were first prepared by ?
9. What were hot spots in r II region of T4 phage ?
10. What you call the inability of members of one population to breed with members of another population because of innate, genetic factors ?

(10 × 1 = 10 marks)

Section B

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

11. What are the 4 parts of a chromosome ?
12. What are the 23rd pair of chromosomes called ?
13. Where does crossing over occur ?
14. What is r II locus ?

Turn over

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15. How do you calculate allelic frequency ?
16. Some mutations are hereditary, give reason.
17. "The Hardy-Weinberg equilibrium rarely applies in reality". Comment on this statement.
18. How is genetic variation maintained in natural populations ?
19. Why are the variable levels and patterns of phenotypic variation important ?
20. What is the importance of crossing over in mitosis ?
21. What are the two genetic principles to prepare Chromosome map ?
22. What is the essence of chiasma type theory ?

(10 × 2 = 20 marks)

Section C

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

23. What are the two types of linkage established on the absence or presence of non-parental combinations?
24. How is chromosome mapping done ?
25. Why do we use maternal inheritance ?
26. What is gene pool in population genetics ?
27. What is genetic drift explain with examples ?
28. Write an account on Gene map distance.
29. Significance of Allopolyploidy.
30. Describe the Inheritance of Iojap trait in Maize.

(5 × 6 = 30 marks)

Section D

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

31. Write an essay on fine structure mapping (r II locus)
32. Write an essay about the Hardy-Weinberg law of population genetics.
33. Illustrates the cases of extra-nuclear inheritance in Shell Coiling in Limnaea and *Mirabilis jalapa.*
34. Write an essay on structural change in the structure of chromosomes.

(2 × 10 = 20 marks)

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