

**THIRD SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

Genetics

GEN 3B 03—BASIC GENETICS

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer all questions.
Each question carries 1 mark.*

1. Define the term 'Allele'.
2. What are dominant characters ?
3. Who coined the term 'gene' ?
4. What is meant by forward genetics ?
5. What is 'Phenotype' ?
6. Give the Mendelian Dihybrid genotypic ratio.
7. Give an example where co-dominance is seen.
8. What are polygenes ?
9. Give any two examples of 'criss-cross' inheritance in humans.
10. Holandric genes.

(10 × 1 = 10 marks)

Part B

*Answer any ten questions.
Each question carries 2 marks.*

11. Gregor Johan Mendel.
12. Reciprocal cross.
13. What are quantitative traits ? Give one example.
14. What is meant by basic chromosome number ? What is its significance ?
15. Sex determination in *Drosophila*.
16. Principle of segregation.

Turn over

17. What is continuous variation ?
18. What are 'Multiple alleles' ? Give an example.
19. What is 'Dominant Epistasis' ? How it is different from Mendelian pattern ?
20. Describe the method of Pedigree analysis. What is its significance ?
21. Differentiate between "Sex-limited traits" and "Sex-influenced traits".
22. Write an account on Haemophilia.

(10 × 2 = 20 marks)

Part C

Answer any five questions.

Each question carries 6 marks.

23. Explain sex-linked inheritance in humans.
24. Describe the cause and consequences of Fragile-X syndrome.
25. Discuss the role of environment on sex determination. Give one example.
26. Explain the principle of Independent assortment based on Mendel's Dihybrid experiments.
27. What are the probability rules applied in Mendelian genetics ?
28. How phenotypic variations take place in Incomplete dominance ? Explain.
29. What is meant by Expressivity of a character ? How it is different from Penetrance ?
30. Write a short account on the scope and significance of Genetics.

(5 × 6 = 30 marks)

Part D

Answer any two questions.

Each question carries 10 marks.

31. Explain Gregor Mendel's Experiments. Comment on his choice of experimental plant and characters studied. What were his conclusions ?
32. Write an essay on the genetics of polygenic traits and its inheritance.
33. Write an essay on the chromosomal basis of Sex-linked inheritance giving suitable examples
34. What are the main features of Lyon's hypothesis? Add a note on its significance.

(2 × 10 = 20 marks)

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION, NOVEMBER 2020

Genetics

GEN 3B 04—BASIC GENETICS

Time : Two Hours

Maximum : 60 Marks

Section A (Very Short Questions)*Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What is meant by genetic variation ?
2. What is SAT chromosome ?
3. Define allosome.
4. Define nullisomy.
5. What is a telomere ?
6. What is SAT chromosome ?
7. Define chromomere.
8. What is colchicine ?
9. Define chromosomal inversion.
10. What is karyotype ?
11. Define aneuploidy.
12. Define monosomy.

(8 × 3 = 24 marks)

Section B (Short Essay Questions)*Answer at least **five** questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. Explain genic balance theory of sex determination.
14. Sex influenced and holandric characters.
15. Explain the structure of the giant chromosome with diagram. Where is it found ?
16. Describe the chemical composition of chromosomes.
17. What is ploidy ? What are the different types ?

Turn over

18. Explain incomplete dominance.
19. Distinguish between dominance and epistasis.

(5 × 5 = 25 marks)

Section C (Essay Questions)

*Answer any **one** question.*

The question carries 11 marks.

20. Citing suitable examples, describe the chromosome theory of inheritance.
21. What are numerical aberrations in chromosomes ? Explain the various types with examples.

(1 × 11 = 11 marks)