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FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2017

(CUCBCSS—UG)

Biotechnology

BTY 4B 05—GENETICS

Time: Three Hours

Maximum: 80 Marks

Section A

Answer any two out of four questions in about 1,500 words.

Each question carries 10 marks.

- 1. Briefly explain Mendel's Laws of inheritance.
- 2. What are nucleosomes? What is the role of nucleosomes in chromosome structure?
- 3. Compare bacterial conjugation, transformation and transduction.
- 4. What are the factors that influence the Hardy-Weinberg equilibrium?

 $(2 \times 10 = 20 \text{ marks})$

Section B

Answer any seven out of fourteen questions in about 750 words.

Each question carries 5 marks

- 5. Discuss how pedigree analysis was used to understand the inheritance of human genetic disorders.
- 6. Describe the irtheritance of blood-type in man.
- 7. Discuss the inheritance of shell coiling in snails.
- 8. Cite an example and discuss the inheritance of sex linked characters.
- 9. What are polytene chromosomes? With a diagram describe polytene chromosomes in Drosophila.
- 10. Compare sex determination in Drosophila with that in man.
- 11. Write a note on the organization of the human genome.
- 12. What are the structural and functional differences between eu- and heterochromatin?
- 13. What causes Down's syndrome?
- 14. What are specialized transducing phages?

Turn over

- 15. Cite an example to illustrate polygenic inheritance.
- 16. How does speciation occur during evolution?
- 17. How is white eye colour inherited in Drosophila?
- 18. What are plasmids?

 $(7 \times 5 = 35 \text{ marks})$

Section C

Answer all questions in about 300 words.

Each question carries 3 marks.

- 19. Distinguish between genetic and epigenetic inheritance.
- 20. What is a karyotype?
- 21. How is replica plating done? What is its application?
- 22. What is genetic drift?
- 23. What is a phylogenetic tree?

 $(5 \times 3 = 15 \text{ marks})$

Section D

Answer all questions in about 200 words.

Each question carries 2 marks.

- 24. State the principle of dominance.
- 25. What is a hybrid?
- 26. What is crossing over?
- 27. Define 'mutation'.
- 28. Define 'gene'.

 $(5 \times 2 = 10 \text{ marks})$