FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2017

(CUCBCSS—UG)

Biotechnology

BTY 5B 07—MOLECULAR BIOLOGY

Time : Three Hours   Maximum : 80 Marks

Section A

Answer any **two** *out of four questions in about* 1500 *words.*
Each question carries 10 *marks.*

1. Explain the various types of damages found in DNA and its repair mechanisms.

2. Give a detailed account on eukaryotic transcription and processing of mRNA.

3. Describe the mechanism of regulation of gene expression in prokaryotes, citing any two operons.

4. Explain the structure, composition and complexity of eukaryotic genome.

(2 × 10 = 20 marks)

Section B

Answer any **seven** *out of fourteen questions in about* 750 *words.*
Each question carries 5 *marks.*

5. Explain Griffith's transformation experiment.

6. Give an account on the structural organization of eukaryotic chromosomes.

7. With suitable diagram explain the structure and composition of prokaryotic genome.

8. Explain the three dimensional structure of DNA.

9. Explain the path of genetic information according to central dogma of modern biology.

10. Define mutation and give an account on the types of mutation in DNA.

11. Describe any one experiment which proves DNA replication occurs via semiconservative method.

12. Give an account on site-specific mechanism of DNA recombination.

13. Give an account on the mechanism of transposition in prokaryotes.

14. Give an account on important features of genetic code.

15. Explain the structure and function of each arm of Cloverleaf model of tRNA.

Turn over

16. Give an account on post translational modification of proteins.

17. Give an account on transcriptional level control of gene expression in eukaryotes.

18. Explain the mechanism of rho-dependent and rho-independent termination of transcription.

(7 × 5 = 35 marks)

Section C

Answer all questions in about 300 words.
Each question carries 3 marks.

19. How Avery and coworkers proved DNA as genetic material ?

20. Explain supercoiling of DNA.

21. Differentiate leading and lagging strand.

22. Give an account on prokaryotic RNA polymerase and its function.

23. What are transposons ?

(5 × 3 = 15 marks)

Section D

Answer all questions in about 200 words.
Each question carries 2 marks.

24. What are Okazaki fragments ?

25. What are exons ?

26. What are molecular chaperones ?

27. What are operator sequences ?

28. What is Chargaff's rule ?

(5 × 2 = 10 marks)