KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2024

Level : B.Tech.
Year : III
Time : 2 hrs. 30mins.

18 DEC 2024

Course : BIOT 302
Semester : II
F. M. : 55

Indicate by checking (√) of each question you have answered in the cover page of main answer book.

SECTION "B"
[5 Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. Describe the genomic organization of three classes of transposons. [3]
2. What happens when there are histones in the path of transcription? What factors play a role in transcription through histones? [3]
3. How does aminoacyl tRNA synthetase recognize the correct amino acid? [3]
4. How does retroregulation work in lamda development? [3]
5. What are homeodomain proteins? What is a leucine zipper? [3]
6. What is epigenetic gene regulation? [3]
7. Describe riboswitches. [3]

SECTION "C"
[5 Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

8. Describe the function and interaction of different elements of the sigma factor in E. coli.[5]
9. Describe diseases caused by defects in RNA splicing? [5]
10. What are the channels through ribosome? Describe two differences between prokaryotic translation initiation and eukaryotic translation initiation. [5]
11. What was the function of repeating copolymers in codon assignment? What is nonsense suppression? [2.5+2.5]
12. How is the choice between lysis and lysogeny determined? [5]
13. Describe the mechanism and function of Xist RNA. [5]
14. Describe intrinsic and extrinsic noise. What are synthetic circuits? [2.5+2.5]

P.T.O.

SECTION "D"

[2 Q. × 2.5 = 15 marks]

Attempt *ANY TWO* questions.

15. Describe the serine recombinase. Describe how Poly-A retrotransposon jumps? Describe how heavy and light chains both undergo VDJ recombination. [2.5+2.5+2.5]

16. Describe alternative splicing of SV40 T antigen. How does mutually exclusive splicing of Dscam work. [2.5+5]

17. What is the function of EF-G? How are ribosomal proteins translational repressors of their own synthesis? Describe. [2.5+5]