'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2021

CC7-MICROBIOLOGY

MOLECULAR BIOLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.

1. Answer any ***five*** of the following: 1×5 = 5

   (a) What are exons and introns?

   (b) Name two inhibitors of protein synthesis.

   (c) What are Okazaki fragments?

   (d) What is spliceosome?

   (e) What is Shine-Dalgarno sequence?

   (f) What is the function of t-RNA synthetase?

   (g) What do you mean by transcription unit?

   (h) What is the function of topoisomerase?

2. Answer any ***three*** of the following: 5×3 = 15

   (a) Discuss the regulation of gene expression during sporulation in *Bacillus* sp. 5

   (b) Write a note on Wobble hypothesis with suitable diagram. 5

   (c) In an experimental setup, *E. coli* growing in a medium containing glucose and lactose together. Explain the phenomenal changes that will happen in this case with reference to gene expression. 5

   (d) What is linking number? How is a Cot curve related to genome complexity? 2+3

   (e) Write notes on fidelity of translation and polyadenylation. $2\frac{1}{2}+2\frac{1}{2}$

3. Answer any ***two*** of the following: 10×2 = 20

   (a) Write the important characteristics of different types (B, A and Z) of DNA with diagrams. 4+3+3

   (b) Explain the positive and negative regulation of lac operon in *E. coli* with the help of suitable diagram. 5+5

   (c) Elucidate the salient features of rolling circle replication and theta replication. 5+5

   (d) Elaborate the mechanisms of initiation in prokaryotic translation with the help of suitable diagram. Discuss the mechanism of alternative splicing. 5+5

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