

**M.Sc. (BIOTECHNOLOGY) SEMESTER II,
ONLINE EXAMINATION, AUGUST 2021
PAPER CODE – MBT-CC201**

PAPER TITLE: EXPRESSION OF GENETIC INFORMATION

Time: Three Hours

Maximum Marks: 75

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Question No. 1.

State whether True (T) or False (F).

[1 x 15 = 15]

- i) IPTG is a gratuitous inducer.
- ii) Ribosomal protein synthesis is controlled by autoregulation.
- iii) The Trp operon is a repressible operon with four transcription units.
- iv) The Trp operon is also controlled by attenuation.
- v) Aminoacyl-tRNA is covalently bonded to the 3'-hydroxyl group on the CCA tail.
- vi) C-terminal domain of lamda repressor protein contains the DNA binding site.
- vii) Lamda repressor dimmers bound at O_{L1} and O_{L2}, do not interact with repressor dimmers bound at O_{R1} and O_{R2}.
- viii) Yeast two hybrid assay is used to detect protein-protein interactions.
- ix) Activity of many signalling proteins in prokaryote is regulated by phosphorylation at histidine residue.
- x) Histones are modified only by acetylation.
- xi) RNA polymerase II transcribes all protein coding genes (mRNA) in eukaryotes.
- xii) Lamda repressor uses a Zinc finger motif to bind DNA.
- xiii) Poor growth conditions cause bacteria to produce (p)ppGpp.
- xiv) By increasing the level of cyclic-AMP, glucose inhibits the transcription of operon that require CRP activity.
- xv) Phosphorylation of a polypeptide is a transient event and sulfation is a permanent post translational modification.

Question No. 2.

Give an account on any three of the following:

[5 x 3 = 15]

- a) Structure of tRNA.
- b) Mechanisms that control the accuracy of translation
- c) Process of translation initiation in prokaryotes.
- d) Process of translation termination in eukaryotes.
- e) Wobble Hypothesis

Question No. 3.

Answer any two of the following questions.

[7.5 × 2 = 15]

- Describe briefly the post translational modifications involving the addition of chemical groups to the nascent polypeptides and their importance.
- Name Inhibitors of protein and RNA synthesis (two each) along with their mechanism of action
- Elaborate the salient features of the signal hypothesis.
- Discuss the transport of proteins via transport vesicles. Give an account of NSF protein and SNAP.

Question No. 4.

Answer any two of the following questions:

[7.5 × 2 = 15]

- GAL genes in yeast is a model for understanding the activation and repression in eukaryote- Elaborate
- Mating-type switching in yeast is a model for understanding cell lineage, gene silencing, and programmed genomic rearrangement- Elaborate
- Describe briefly the role of methylation in the regulation of gene expression in eukaryotes
- Briefly describe the process of Chromatin remodelling and its role in eukaryotes

Question No. 5.

Answer any two of the following questions:

[7.5 × 2 = 15]

- Briefly describe the salient features of Lac operon. Explain the dominant phenotype of *lacI^d* mutant.
- Describe briefly the transcription termination control mechanism in prokaryote.
- Elaborate the role of sigma factor in control of sporulation.
- Describe the regulatory events that control the lytic cascade in phage lamda.

***It should be noted that 60 minutes extra time will be provided to scan your answer sheets, build a PDF and upload it to
blotechnologyexam2020@gmail.com***