

2 ½ Hours

Total Marks: 75

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.
5. For **Q.2, Q.3 and Q.4** attempt **A and B OR C and D**.

Q 1 Do as directed (Any fifteen)**15**

1. Define enhancer elements.
2. State the significance of TATA box.
3. State true or false: Sigma factor is required throughout the transcription in prokaryotes
4. What are splisosomes ?
5. State function of RNA polymerase II.
6. What does CPSF stand for?
7. What are introns?
8. _____ is an enzyme which adds formyl group to methionine during initiation of translation in bacteria.
9. Give the significance of A-site in translation process.
10. Ubiquitin tags protein to target it for degradation. (State true or false).
11. What are sense codons?
12. The m-RNA ribosome binding site region in bacteria is commonly known as the _____ sequence
13. Each m-RNA codon that specifies an amino acid in a polypeptide chain consists of _____ nucleotides.
14. During protein sorting, once the signal sequence is fully into the cisternal space of the endoplasmic reticulum, it is removed from the polypeptide by the enzyme _____
15. All of the genes involved in functioning of the lac operon are inducible. (State True or False)
16. Define : Catabolite repression

17. The *cro* protein and λ repressor proteins bind to the same sites within OR.
(True or False)
18. Anthranilate synthetase component I is coded by _____ gene.
19. _____ is a phenomenon whereby a gene is transcriptionally silent due to its location and not because of the action of a specific repressor.
20. Define miRNA.

Q. 2 A Explain initiation of transcription in prokaryotes **08**

Q. 2 B What is 5' capping? Explain. **07**

OR

Q. 2 C Explain termination of transcription in eukaryotes. **08**

Q. 2 D Explain Rho independent termination of transcription. **07**

Q. 3 A State the steps involved in elongation phase of translation. Explain any two steps in detail. **08**

Q. 3 B Draw the structure of t-RNA. Explain the role of t-RNA in translation. **07**

OR

Q. 3 C Explain the translocation of proteins into endoplasmic reticulum in eukaryotes with the help of a suitable diagram. **08**

Q. 3 D List any four characteristics of genetic code. Explain wobble's hypothesis with an example. **07**

Q. 4 A Elaborate on the molecular model for attenuation of the *trp* operon. **08**

Q. 4 B Write a note on mutants of *lac* operon. **07**

OR

Q. 4 C Give an account of positive regulation of *lac* operon. **08**

Q. 4 D Discuss regulation of transcription initiation by activators and repressors. **07**

Q. 5 Write Short notes on **any three** of the following

15

- a. Gene silencing
- b. Genetic switch in lambda phage
- c. Degeneracy of Genetic code.
- d. Amino-acylation of t-RNA.
- e. RNA editing
