

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted during the academic year 2011 – 12 & thereafter)**

**SUBJECT CODE: 11BT/MC/ML64**

**B. Sc. DEGREE EXAMINATION, APRIL 2015**  
**BRANCH V (a) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**  
**SIXTH SEMESTER**

**COURSE : MAJOR – CORE**  
**PAPER : MOLECULAR BIOLOGY**  
**TIME : 3 HOURS**

**MAX. MARKS: 100**

**SECTION A**

**ANSWER ALL QUESTIONS**

**I CHOOSE THE CORRECT ANSWER**

**(5 x 1 = 5 Marks)**

1. The DNA strand that is used as a template for RNA synthesis is called  
a) coding strand      b) non- coding strand      c) leading strand      d) lagging strand
2. In prokaryotic translation the release factor RF1 recognizes.  
a) UAA and UAG      b) UAA and UGA      c) AUG and UAG      d) GAG and UAA
3. Lac z structural gene encodes the enzyme.  
a)  $\beta$  - galactosidase      b) lactose permease      c) transacetylase      d) hexokinase
4. The other name for signalling molecule is  
a) ligand      b) receptor molecule      c) surface receptor      d) lariat
5. The tRNA has a 3'- GGC-5' anticodon and it is complementary to  
a) 5' -GGC - 3' codon      b) 3' - CCG - 5' codon      c) 3'- GGC -5' codon      d) 5'- CCG - 3' codon

**II FILL IN THE BLANKS**

**(5 x 1 = 5 Marks)**

6. The enzyme that catalyzes the synthesis of RNA is \_\_\_\_\_.
7. The trp operon encodes enzymes that are needed for the biosynthesis of \_\_\_\_\_.
8. If one strand of DNA has the sequence of ATGGCGGATTT then the opposite strand must be \_\_\_\_\_.
9. The \_\_\_\_\_ in the tRNA is complementary to the codon in the mRNA.
10. The active G- protein is linked to \_\_\_\_\_.

**II State whether the following statements are true or false.**

**(4 x 1 = 4 Marks)**

11. RNA polymerase always connects nucleotides in the 5' to 3' direction.
12. Repressor is a regulatory protein that binds to the DNA and inhibits transcription.
13. The three codons UAA, UAG & UGG are called stop codons
14. The cell receiving signal is called the effector cell.

**IV Match the following.****(4 x 1 = 4 Marks)**

- |                            |                           |
|----------------------------|---------------------------|
| 15. $\alpha_2\beta\beta_1$ | (a) single ring structure |
| 16. Purine                 | (b) Repressor protein     |
| 17. Pyrimidine.            | (c) ring structure        |
| 18. Operator.              | (d) core enzyme           |

**V Write short notes on any SIX each in about 50 words.****(6 x 3 = 18 Marks)**

19. Lariat
20. Holoenzyme
21. Attenuation
22. Operon
23. Shine - dalgarno sequence
24. Peptidyl transferase
25. Frameshift mutation
26. Chargaff's rule
27. Ligand.

**SECTION B**

**ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS; EACH ANSWER SHOULD NOT EXCEED 200 WORDS.**

**(4 x 6 =24 Marks)**

28. Discuss the differences between  $\rho$  (Rho) - dependent and  $\rho$  - independent termination of transcription.
29. What is an operon? Describe its general organisation.
30. Explain the salient features of the genetic code.
31. Briefly discuss the post transcriptional processing of mRNA.
32. Give an account of functions of cell surface receptors.
33. Explain the denaturation and renaturation kinetics of DNA.

**SECTION C**

**ANSWER ANY TWO FOLLOWING QUESTIONS IN ABOUT 1000 WORDS EACH. DRAW DIAGRAMS / FLOWCHARTS WHEREVER NECESSARY. (2 x20 = 40 Marks)**

34. Give an account of the different types of DNA?
35. What are the three stages of translation?
36. Describe the organisation of the ara operon and other genes involved in arabinose metabolism?
37. Describe the process of transcription in prokaryotes?

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