

B. Sc. DEGREE EXAMINATION, APRIL 2017  
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)

- In deoxyribose sugar the hydroxyl group is absent in the position  
a. Three                      b. Five                      c. Two                      d. One
- The -10 to -35 upstream sequence is the  
a. terminator                      b. Leader                      c. promoter                      d. regulator
- In the genetic code most amino acids are coded by more than one triplet codon this is due to  
a. Mutation                      b. Open reading frame                      c. Redundancy                      d. Anticodon
- In Lac operon the structural Z gene codes for  
a. Promoter                      b. Galactosidase                      c. Inducer                      d. Repressor
- The central element in the MAP kinase pathway is  
a. Serine kinase                      b.  $Ca^{2+}$                       c. cAMP                      d. G-Protein

II FILL IN THE BLANKS

(5 x 1 = 5 Marks)

- When a purine is replaced by a pyrimidine in a mutation it is called -----.
- The mRNAs are modified at the 5' end by the addition of -----.
- In eukaryotes during translation the Met-t-RNA binds with the ----- ribosomal subunit
- Ara operon is a ----- operon .
- MAP kinase pathway is a -----signal regulated pathway.

III State whether the following statements are true or false.

(4 x 1 = 4 Marks)

- The B DNA is the most stable of the three forms.
- Polycistronic mRNAs are produced at the end of transcription in prokaryotes.
- Cell surface receptors bind to an external ligand molecule.
- The trp attenuator is a terminator site rich in the AT sequence.

IV Match the following.

(4 x 1 = 4 Marks)

- |                             |   |                      |
|-----------------------------|---|----------------------|
| 15. 80 S ribosomal unit     | - | feed back inhibition |
| 16. 70 S initiation complex | - | phosphorylation      |
| 17. trp operon              | - | eukaryotes           |
| 18. protein kinase          | - | prokaryotes          |

**V Write short notes on any SIX each in about 50 words.**

**(6 x 3 = 18 Marks)**

19. Insertion
20. tRNA
21. Splicing
22. Repressor
23. Shine Dalgarno sequence
24. hn RNA
25. Transmembrane receptor
26. Attenuator
27. Signal peptide

### **SECTION B**

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

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

28. Write short notes on r RNA.
29. Describe post transcriptional modification of the mRNA.
30. With schematic diagram explain the gene regulation in lac operon.
31. Explain genetic imprinting.
32. Discuss the MAP Kinase pathway.
33. Explain point mutation with the help of suitable examples.

### **SECTION C**

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

34. Give a detailed account of prokaryotic gene regulation using ara operon model.
35. Explain in detail protein synthesis in prokaryotes.
36. Give an account of the mechanism of translation.
37. Describe the role of signalling molecules and their receptors and its functions.

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