



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

I SEMESTER M.TECH. EXTERNAL EXAMINATIONS NOVEMBER 2019

SUBJECT: Molecular Biology and rDNA Technology [BIO 5153]

Date of Exam: **19/11/2019** Time of Exam: **2.00 PM – 5.00 PM** Max. Marks: **50**

- ❖ Answer ALL the questions
- ❖ missing data may be suitable assumed

- 1 A. Describe the structural and functional properties that differentiate the euchromatin and heterochromatin.
B. What is Shine-Dalgarno sequence? In which groups of microorganisms it is found?
C. Compare and contrast A form, B form DNA to that of Z form. Why B DNA is common to find than other form. (3+3+4)
- 2 A. What has enabled a given tRNA that sometimes it specifically recognizes several codons? Explain this phenomena.
B. Retrovirus do not follow central dogma. Comment.
C. Write different post translational modification that are essential for the functioning of the protein. (3+3+4)
- 3 A. What is meant by the term DNA denaturation? How does denaturation depend on the GC content of the DNA? How does this variable affect the T_m ?
B. Define: Proximal promoter region and LCR.
C. Give a detailed account of causes, types and effect of mutations. (3+3+4)
- 4 A. Would it be appropriate to use DNA probes such as VNTR in DNA finger printing Justify?
B. Write the principles and the limitation of chain termination method of DNA sequencing.
C. Enlist the essential requirement for a DNA molecule to be considered as a vector in cloning. Give details of vectors used in rDNA technology. (3+3+4)
- 5 A. Give an account of DNA synthesis by RNA dependent DNA polymerase. Explain the significance of this process in genetic engineering.
B. How genetic engineering techniques are helpful in crop improvement? Discuss with example.
C. Explain the steps involved in the production of humulin (human recombinant insulin). (3+3+4)