Exam.Code:0436
Sub. Code: 3472

1057

M.Sc. (Bio-Technology) Second Semester

MBIO-201: Molecular Biology

Time allowed: 3 Hours Max. Marks: 80

***NOTE**: Attempt <u>five</u> questions in all, including Question No. I which is compulsory and selecting two questions from each Unit. All questions carry equal marks.*

x-x-x

I. Attempt the following:-

a) What was the experiment by Avery et al. What did they interpret from this experiment?
b) Draw A-T base pairing
c) Differentiate between initiation of transcription in eukaryotic and prokaryotic transcription
d) What is the role of Tu in translation?
e) Explain why a map is a useful aid to genome sequencing.
f) Write in brief about application of RFLP in disease prognosis.
g) What is hammer head ribozyme? Explain.
h) How was it determined that the human genome contains counterparts to the oncogenes found in retroviruses?

UNIT – I

II. a) The major groove of B-DNA is rich in chemical information. Explain.
b) Describe the factors that contribute to the high fidelity of DNA replication.
c) Discuss three different properties of DNA polymerase I

III. a) What is an Okazaki fragment and what is its biological significance?
b) Write in brief about Holiday junction and Cre/Lox recombination.

UNIT – II

IV. a) What is the nature of a promoter sequence in prokarytes and why is it important? What would be the likely effect of a mutation that would prevent sigma from dissociating from the RNA polymerase core?
b) Discuss in brief the post-transcriptional modifications of eukaryotic RNA.

V. a) How do prokaryotes and eukaryotes differ in mechanism for selecting an AUG codon as a start for polypeptide synthesis? Discuss the initiation process in detail
b) What is meant by post-translational modification of proteins?

UNIT – III

VI. a) Discuss the different molecular mechanisms that have been shown to activate the expression of human oncogenes.

b) What role is played by the retinoblastoma and p53 tumor suppressor gene in controlling the onset of cancer?

P.T.O.

VII. a) What is antisense technology? What are its medical applications?

b) What is the difference between antisense technology and RNAi technology for the knock down the expression of a gene?

UNIT – IV

VIII. Distinguish between 'genetic mapping' and 'physical mapping'. What are the strengths and weaknesses of the two techniques?

a) What is FISH and how is it used to construct a physical map?

b) Explain the basis of sequence tagged site (STS) mapping, and list the various DNA sequences that can be used as STSs.

IX. a) Differentiate between Sanger's method of sequencing and next generation sequencing.

b) What is YEC? Explain the method for construction of YAC library in detail.

x-x-x