Exam.Code:0436
Sub. Code: 3472

1059

M.Sc. (Biotechnology) Second Semester

MBIO-201: Molecular Biology

allowed: 3 Hours **Max. Marks: 80**

E: Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I - IV.

x-x-x

UNIT – I

I. a) Discuss the three repetition classes of eukaryotic genomic DNA.

b) Discuss the features of the DNA molecule described by Watson and Crick?

c) Draw the structure of ATP. (5,5,6)

I. a) Describe the events leading up to and including the formation of bi-directional replication forks at *oriC.*

b) Describe the three enzymatic activities of DNA polymerase I and its relationship to function. (8,8)

UNIT – II

. a) Describe three distinctly different ways in which eukaryotic messenger RNA is modified after the gene is transcribed. Discuss all processes in detail.

b) Differentiate between eukaryotic and prokaryotic initiation of transcription.

c) What is a promoter sequence and what is the role of sigma factor in identification of promoter? How expression of genes changes during sporulation? (8,4,4)

a) Describe the process of charging of a tRNA. How the structurally similar amino acids are differentiated in this charging process? Explain with help of example.

b) Differentiate between the initiation of translation in eukaryotes and prokaryotes.

c) Discuss the role of EF-Tu in proofreading of translation. (8,4,4)

UNIT – III

a) What is lac operon and how is it induced? What is catabolic repression? Discuss. What will happen if *lad* gene product is mutated for DNA binding?

b) What is attenuation and how it works? Discuss with help of example. (8,8)

P.T.O.

VI. Write in brief:-

a) Technology for development of flavor savour tomato

b) Role of polyadenylation in translation

c) Strategies for designing ribozymes (5,5,6)

UNIT – IV

VII. a) Differentiate between

i) RFLP, RAPD and AFLP

ii) Genetic and physical maps

b) Discuss in brief the use of in situ hybridization in genome analysis. (10,6)

VIII. a) Discuss the process of regulation of cell cycle after DNA damage with emphasis on p53 and pRb.

b) What are oncogenes? Discuss the similarity and differences of viral and cellular oncogenes. Give two examples of each class. (8,8)

UNIT – V

IX. Attempt the following:-

a) Discuss Cre/Lox recombination.

b) How acetylation of histones effect the chromatin remodeling? Discuss in detail the effect of acetylation on different sites of H3 and H4 histones.

c) What are constitutive and inducible promoters? Discuss their significance. What type of genes are grouped under these two categories in an organism?

d) Write in brief about genetic counseling. (4x4)

x-x-x