Exam.Code:1033
Sub. Code: 35401

2055

M.E. (Bio-Technology) Second Semester

ME-BIO-204: Genetic Engineering

Time allowed: 3 Hours

Max. Marks: 50

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

x-x-x

I. Attempt the following:-

a) How is α- complementation used for screening recombinant colonies of *E. coli*?

b) What are neoschizomers?

c) How does sodium ion concentration affect melting temperature of DNA?

d) What is the role of RNase H incDNA synthesis?

e) What are autonomous transposable elements? Give an example.

f) What are co-dominant markers?

g) What is a paratope?

h) How does interference affect the number of double crossovers?

i) What are padlock probes?

j) How do restriction endonuclease producing organisms protect their own DNA from them?

(10x1)

<u>UNIT - I</u>

II. a) Describe the detailed strategy to clone DNA sequences that encode eukaryotic proteins.

b) What are type II restriction nucleases? Discuss their importance in recombinant DNA technology.

c) What is Hot Start PCR?

(4,3.5,2.5)

III. a) Describe two strategies to insert the gene of your interest into baculovirus genome for expression in host cells.

b) What is error prone PCR? How do the components/conditions of error prone PCR differ from conventional PCR?

(5,5)

P.T.O.

IV. a) Describe the general features of mammalian expression vectors. Give an overview of the strategy to express a two-chain protein (heterodimer) in mammalian cells.

b) Explain strategy to simultaneously alter multiple properties of an industrially important enzyme. (5,5)

UNIT - II

V. a) Describe the PCR-OLA method for detection of gene defects causing inherited disorders.

b) How are monoclonal antibodies made? Discuss the clinical applications of monoclonal antibodies. (5,5)

VI. a) Discuss the properties of molecular beacons. How can molecular beacons be used for detection of microorganisms?

b) Discuss the strategies to eliminate marker genes from nuclear genomes of transgenic plants. (5,5)

VII. a) Discuss the biological production of L-ascorbic acid by genetic engineering methods.

b) Write short notes on:

i) Microbial bioremediation

ii) AFLP (5,5)

x-x-x