Exam.Code:1033
Sub. Code: 35401

2056

M.E. (Bio-Technology) Second Semester

ME-BIO-204: Genetic Engineering

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five 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) What is klenow fragment?

b) Would the restriction enzyme that recognizes and cuts a four base pair sequence be used to clone the gene of your interest in a plasmid vector? Give reason.

c) What are shuttle vectors?

d) What is the main difference between standard PCR and quantitative PCR?

e) What is Shine Dalgarno sequence?

f) What is a totipotent cell?

g) What are co-dominant markers?

h) What is the role of T-DNA in genetic engineering?

i) What are linked genes?

j) What is phytoremediation? (10x1)

UNIT - I

II. a) Describe a detailed strategy for construction of cDNA library. What are the advantages and disadvantages of cDNA libraries?

b) Differentiate between type I and type II restriction enzymes.

c) What is touch down PCR? (4.5, 3,2.5)

III. a) What is a cloning vector? Give a brief outline of the cloning vectors for *E. coli* along with their DNA insertion capacities.

b) What is the principle of real time PCR? Compare the merits and demerits of using SYBR dyes and Taqman for real time PCR.

c) Discuss the methods that are used for transfection of mammalian cells. (4.5, 3, 2.5)

P.T.O.

IV. a) What is enzyme engineering? Give a detailed account of directed evolution approach to improve the catalytic properties of enzymes.

b) Discuss the features of yeast episomal plasmids. How do they differ from YIPs?

c) What are retroviruses? How are they used as animal vectors? (4.5,3,2.5)

UNIT - II

V. a) What are SSR markers? List their applications, advantages and limitations.

b) What are molecular beacons? Discuss the design of molecular beacons and their applications in diagnostics. (5,5)

VI. a) Differentiate between :

i) *invivo* and *ex vivo* gene gene therapy

ii) RFLP and RAPD

b) What are *Bt* transgenic plants? Discuss the production of *Bt* transgenic plants. (5,5)

VII. a) How are mouse monoclonal antibodies humanized? Discuss the importance of humanization of monoclonal antibodies.

b) Describe the PCR-OLA technique and discuss its diagnostic applications. (5,5)

x-x-x