BG/K/TX

Reg. No: 22BQ1010[illegible]

VIT
Vellore Institute of Technology

Final Assessment Test – November 2024

Course: BBIT302L - Genetic Engineering
Class NBR(s): 4160 / 4170
Time: Three Hours

Slot: B1+TB1
Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions
(10 X 10 = 100 Marks)

1. List out the enzymes used in Genetic engineering and write their function and applications.
2. Describe the TA vector and BAC vector with suitable vector map.
3. Explain one yeast expression vector and mammalian cell expression vector with suitable vector map.
4. Compare physical and chemical methods of transformation based on feasibility, efficiency and cost.
5. Describe different methods used to synthesize probes.
6. a) What is the Ct-value in real-time PCR and what does it mean?
   b) Why in real-time PCR, target gene expression levels are often normalized to the expression of a housekeeping gene (reference gene)?
   c) Describe the PCR technique used to extend the partial cDNA clones by amplifying the 5' sequences of the corresponding mRNAs.
7. Explain the various biosafety regulations followed while working with genetically modified organisms
8. Which type of library construction uses mRNA as the source material? Describe the procedure for constructing this library with appropriate diagrams.

9.a) A plasmid was cleaved with restriction enzymes, both individually and in various combinations. The following fragment sizes (base pairs) were determined by agarose gel electrophoresis.

EcoRI + AvaI	2400, 1600
EcoRI + PstI	3600, 400
AvaI + PvuII	3400, 600
AvaI + PstI	2000
PvuII + PstI	2600, 1400
EcoRI + PvuII	2200, 1800

Construct a restriction map based on these data, indicating the distances between each restriction site.

OR

9.b) What is a primer? Describe the key parameters involved in its design and use.

10.a) List out 10 commonly used promoters in various expression vectors

OR

10.b) Explain the procedure followed in synthesising *Aspergillus* oryzae α - amylase recombinant protein in E-coli.

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