VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

School of Bio Sciences and Technology

Winter Semester 2023- 2024

Continuous Assessment Test – II

Programme Name & Branch: B Tech Biotechnology

Course Name & code: Genetic Engineering, BBIT302L

Class Number (s): VL2023240502391, VL2023240502388, VL2023240502389 Slot :F1/TF1

Faculty Name (s): Alka Mehta, Gothandam K M, Kannan P

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Answer all the question. Draw suitable diagram wherever required

Q. No.	Question	Max Marks
1.	Outline the importance of promoters in expression of a gene, detail on an expression vector with inducible promoter for the expression of recombinant proteins.	10
2.	a. Illustrate the electroporation technique used for the transformation and write its principle. b. Apply your knowledge on transformation techniques to suggest appropriate technique to be used for the following cell types and also give the brief description of the technique suggested: i. Animal cells *ii.* *E.coli* *iii.* Yeast *iv.* Plant cell	10 (5+5)
3.	Construct the genomic DNA library of a plant *Cincinnta californica* having genome size $7.8X10^7$ nucleotide. Use a restriction enzyme which creates DNA fragments of approximately 25 Kb. a. Select suitable vector to be used to create the library? b. Draw the genetic map of the vector and describe all the steps in library preparation? c. How many clones will be formed from single genome?	10
4.	Explain the basic principle of PCR? Giving suitable reason suggest and briefly describe the PCR variant to be used in the following situations. a. To increase sensitivity and fidelity of basic PCR by reducing cycle number. b. To amplify a DNA fragment for which the sequences of the flanking region is not known. However, some sequence in the middle of gene is known. c. To find the quantity of DNA after each cycle.	10
5.	Identifying tissue or cell-specific gene expression is an integral part of functional genomics studies. An OsMADS27 transcription factor is specially expressed only in the root cells of the rice plant. Write the different techniques used to confirm the aforementioned statement with suitable diagrams.	10