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18BT56

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Genetic Engineering and Applications

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are YAG vectors? Describe the construction and screening techniques in YAC vectors. (10 Marks)
b. Distinguish between exonucleases and endonucleases. Elaborate the action mechanism and applications of restriction endonucleases. (10 Marks)

OR

- 2 a. A small gene of size 5 KB needs to be expressed in E.Coli DH5 α strain. Choose a suitable vector for this expression and explain the screening strategy. (10 Marks)
b. Describe the importance of various end modifying enzymes in genetic engineering. (10 Marks)

Module-2

- 3 a. COVID 19 is a retrovirus. Apply a suitable variant of PCR for the diagnosis of this virus. (10 Marks)
b. Describe the functions of detergents like SDS or CTAB, chloroform, sodium salts, EDTA and isopropyl alcohol in nucleic isolation. (10 Marks)

OR

- 4 a. Describe the Southern Blotting technique. (10 Marks)
b. Distinguish between genomic and cDNA libraries. Explain the construction of cDNA libraries. (10 Marks)

Module-3

- 5 a. Distinguish between direct and indirect gene transfer. Explain Agrobacterium mediated gene delivery into plant cells. (12 Marks)
b. Describe the micro projectile bombardment technique of gene transfer. (08 Marks)

OR

- 6 a. Explain electroporation and liposome mediated gene transfer. (12 Marks)
b. What are transplastomic plants? Narrate their applications. (08 Marks)

Module-4

- 7 a. How did transgenic science contributed in offering resistance against Bollworm in cotton plants? Explain. (08 Marks)
b. Assess the efficiencies and deficiencies of RFLP, RAPD, SNP and SSR markers in Marker assisted selection. (12 Marks)

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18BT56

- 8 a. Distinguish between abiotic and biotic stresses to the crops. Explain few examples where in transgenic techniques were applied to offer resistance against abiotic stresses. (12 Marks)
- b. What is biopharming? Explain "plants as Bioreactors". (08 Marks)

Module-5

- 9 a. Differentiate between ex vivo and in vivo gene therapy. Describe the gene therapy tried for SCID treatment. (10 Marks)
- b. Elucidate the recombinant DNA steps in heterologous expression of insulin. (10 Marks)

OR

- 10 a. Explain the gene silencing approaches. (10 Marks)
- b. Summarize the contributions of rDNA technology into pharma and environmental sectors. (10 Marks)

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