M. Sc. Biotechnology Examination, 2024

(2nd Year, 1st Semester)

Plant and Microbial Biotechnology

Paper : PG/334T

Time : 2 *Hours* *Full Marks* : 40

GROUP—A1

Answer *any* **three** questions. 5×3

1. Distinguish between dominant and co-dominant markers. Which of these is more suitable for studying genetic diversity and why? 2+1+2

2. Mention different applications of AFLP in plant breeding. What are its advantages over RAPD? 3+2

3. What are different goals of metabolic engineering in plants? How can several genes be co-ordinately up or down regulated to achieve successful engineering of a biochemical pathway? 2+3

4. What are different types of plant bioreactors? What are the advantages of using bioreactors for hairy root culture? 2+3

5. What are the advantages of using plant bioreactors? Discuss the use of plant bioreactors for producing pharmaceuticals. 3+2

6. What are different receptors for Bt toxin found in insects? Briefly discuss the mode of action of Cry protein binding by any one of these receptors. 2+3

GROUP—A2

7. Write briefly about the process of agrobacterium mediated generic transformation in plants. Differentiate between selectable and scorable marker genes. (3+2=5)

(OR)

8. Write some advantages of direct gene transfer methods over agrobacterium-mediated DNA transfer. What do you mean by GUS assay? What are the advantages of plastid transformation technique over nuclear transformation? (2+1+2=5)

GROUP—B1

Answer *any* **two** questions. (5×2)

9. Describe different Genotypic and Phenotypic methods for the identification of bacterial strains. 2.5+2.5

10. Describe different ex-situ and in-situ bioremediation methods for detoxification of contaminated environments. 2.5+2.5

11. Define the "healthy" gut microbiota and dysbiosis with respect to the microbiota–gut–brain axis. 2.5+2.5

12. What is "Fecal microbiota transplantation (FMT)"? Name different mechanisms proposed for FMT. 1+4

GROUP—B2

13. Answer ***any five*** questions. (1 × 5 = 5)

(i) What is SCP? What are its uses?

(ii) What are bio fuels? Give examples.

(iii) What are the differences between broad spectrum and narrow spectrum mercury resistant bacteria?

(iv) What is molasses? How is it obtained?

(v) What is xenobiotic? Give examples.

(vi) Why is Penicillin called an idiolite?

(vii) What is the principle behind enzyme immobilization technique?

14. Write short note on ***any one*** of the following : 5

(i) Strain Improvement

(ii) Waste Water Treatment

(iii) Fermented Food

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