

M.Sc. MICROBIOLOGY  
FOURTH SEMESTER  
AGRICULTURAL MICROBIOLOGY  
MMB-401  
[USE OMR SHEET FOR OBJECTIVE PART]

**SET  
A**

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

( Objective )

Choose the correct answer from the following:

1 × 20 = 20

- The bioremediation process involving the usage of Fungus to degrade pollutants is:
  - Composting
  - Phytoremediation
  - Mycoremediation
  - Land farming
- Bio-stimulation involves:
  - Addition of microbes to a cleanup site
  - Eliminating microbes
  - Addition of microbes to a cleanup site
  - Bioventing
- Example of the sedimentary cycle:
  - N Cycle
  - P Cycle
  - C Cycle
  - O Cycle
- Which of the following fixes nitrogen along with carbon dioxide?
  - Bacillus*
  - Beijernickia*
  - Clostridium*
  - Rhodospirillum*
- Oscillatoria* is a free-living nitrogen fixer generally found in:
  - Paddy field
  - Maize rhizosphere
  - Sugarcane rhizosphere
  - Anabaena*
- Azorhizobium* forming nodules to fix nitrogen with:
  - Soyabean
  - Sesbania
  - Maize
  - Pea tree
- Which of the following is a coupled biofertilizers?
  - Salmonella* and *E. coli*
  - Nostoc* and legume
  - Rhizobium* and grasses
  - Azolla* and BGA
- Mycorrhiza shows what type of relationship?
  - Symbiosis
  - Parasitism
  - Endemism
  - Antagonism
- The source of carbon to the plants according to the carbon cycle is:
  - Fossil fuel
  - Atmospheric CO<sub>2</sub>
  - Carbonated rocks
  - All of the above
- The degradation of complex molecules in soil by fungi for utilization by bacteria is an example of which type of association?
  - Commensalism
  - Neutralism
  - Mutualism
  - Syntrophism

11. The utilization of organic material to produce energy is referred to as:
  - a. Biomass energy
  - b. Hydro thermal energy
  - c. Geothermal energy
  - d. Nuclear energy
12. Which organic molecules are found in biogas?
  - a. Butane gas and carbon dioxide
  - b. Methane gas and CO<sub>2</sub>
  - c. Sodium
  - d. Nitrogen
13. The association which involves the exchange of nutrients between two species is referred to as.....
  - a. Mutualism
  - b. Syntrophism
  - c. Antagonism
  - d. Neutralism
14. Which of the following devices directly transfers energy from fuel burning into electrical energy?
  - a. Dynamo
  - b. Ni-Cd cell
  - c. Fuel cell
  - d. Electrolytic cell
15. What kind of energy can a fuel cell transform from chemical energy?
  - a. Mechanical
  - b. Potential
  - c. Solar
  - d. Electrical
16. Transgenic plants are the one:
  - a. Produced by transferring genetic material from one plant cell to another
  - b. Produced by a somatic embryo in an artificial medium
  - c. Grown in the artificial medium after hybridisation in the field
  - d. Produced after protoplast fusion in an artificial medium
17. One transgenic crop that shows promise is golden rice. When made available for planting, it will aid in:
  - a. Herbicide tolerance
  - b. Pest resistance
  - c. Alleviation of vitamin A deficiency
  - d. Producing a petrol-like fuel from rice
18. The .....is where organisms that are found on and in the aerial surface plants are growing.
  - a. Phyllosphere
  - b. Rhizosphere
  - c. Rhizoplane
  - d. Microfilm
19. Methanotrophic bacteria:
  - a. Oxidize methane gas
  - b. Produce methane gas
  - c. Utilize methane as the electron source.
  - d. Responsible for the greenhouse effect
20. In India, scientists have created a genetically engineered brinjal with the intention of:
  - a. Enhancing mineral content
  - b. Drought resistance
  - c. Insect resistance
  - d. Self-life enhancement



**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

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|--|----------|
| 1. What is Nitrogen cycle and what significant role it plays in the agriculture. Explain with diagram.                         | 10       |
| 2. Provide an in-depth analysis of mycorrhiza, focusing on its function in crop production.                                    | 10       |
| 3. Write distinctive short notes: ( <i>any two</i> )   | 5+5=10   |
| a) C-cycle   |          |
| b) VAM   |          |
| c) Leghemoglobin   |          |
| 4. Define a PGPR organism. Provide an in-depth analysis of the role that PGPR plays in agriculture.                            | 2+8=10   |
| 5. Write distinctive short notes: ( <i>any two</i> )   | 5+5=10   |
| a) Biofuel   |          |
| b) Metagenomics  |          |
| c) Microbial interactions in soil  |          |
| 6. What is a transgenic? Write a detailed account on transgenic plants and its significances.                                  | 2+8=10   |
| 7. Explain herbicide. In what way does it aid in the growing of crops? Could herbicides perhaps have negative effects as well? | 2+5+3=10 |
| 8. Biofuel, what is it? Compose a brief overview of the idea of using microbes to produce biofuels.                            | 2+8=10   |

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