

B.Sc. MICROBIOLOGY
THIRD SEMESTER
AGRICULTURAL MICROBIOLOGY
BMB-304
[USE OMR SHEET FOR OBJECTIVE PART]

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

- Which of the following is the most fertile soil?
 - Loamy soil
 - Black soil
 - Sandy soil
 - Red
- Which element is humus especially rich in?
 - Carbon
 - Nitrogen
 - Gold
 - Oxygen
- Irish Famine occurred due to:
 - Brown spot of rice
 - Ergot poisoning
 - Late blight of potato
 - Coffee rust
- Which one of the following can solubilize phosphate?
 - Rhizobium*
 - Azospirillum*
 - Azolla*
 - Vesicular Arbuscular Mycorrhiza*
- Which of the following is used as a biocontrol agent against caterpillars of butterflies?
 - Trichoderma*
 - Streptococcus*
 - Bacillus Thuringiensis*
 - Saccharomyces cerevisiae*
- The aerobic digestion of sewage is utilized in the production of:
 - Biofuel
 - Biomass
 - Synthetic fuel
 - Silage
- This is also called a biogas:
 - Biobutanol
 - Biodiesel
 - Bioethanol
 - Biomethane
- The term "transgenic" was first used by:
 - Boyer and Cohen
 - Gordon and Ruddle
 - Franklin Costantini
 - Elizabeth Lacy
- Viruses can be isolated from clinical samples by cultivation in the following except:
 - Tissue culture
 - Chemically defined media
 - Embryonated eggs
 - Animals
- What is the scientific study of soil called?
 - Entomology
 - Ornithology
 - Earth studies
 - Pedology

11. Which of the following is incorrectly matched?
 - a. *Alnus* - *Frankia*
 - b. Alfalfa - *Rhizobium*
 - c. Nitrogen fixer - *Anabaena*
 - d. Mycorrhiza - *Rhodospirillum*
12. Pick the correct statement.
 - a. Legumes do not fix nitrogen
 - b. Legumes fix nitrogen independent of bacteria
 - c. Legumes fix nitrogen through bacteria in their roots
 - d. Legumes fix nitrogen through bacteria in their leaves
13. In nitrification, ammonia is converted to:
 - a. Nitrogen
 - b. Nitrate
 - c. Nitrous oxide
 - d. Nitrite
14. Nitrogen is absorbed by the plants in the form of:
 - a. Ammonium
 - b. Nitrite
 - c. Nitrate
 - d. All
15. Indole-3-Acetic acid is produced by:
 - a. Silicate solubilizing bacteria
 - b. Potassium solubilizing bacteria
 - c. Methanogens
 - d. Methanotrophs
16. Methane oxidation occurs in presence of:
 - a. Methanogens
 - b. Methanotrophs
 - c. Acidogens
 - d. Both (b) and (c)
17. Rust of wheat is caused by:
 - a. Fungi
 - b. Bacteria
 - c. Virus
 - d. Protozoans
18. Antinutritive factor in soyabean is due to:
 - a. Raffinose
 - b. Stachyose
 - c. Lysine
 - d. Both (a) and (b)
19. Second generation biofuels are fuels made from:
 - a. Food crops
 - b. Woody biomass
 - c. Algae
 - d. Solar fuels
20. Cytoplasmic polyhedrosis virus develops in:
 - a. Cytoplasm
 - b. Host cell nuclei
 - c. Either nuclei or cytoplasm
 - d. Epidermis

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

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

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| 1. Explain in detail the mechanism of biocontrol with diagrams. | 10 |
| 2. What is disease triangle and disease cycle? Explain the steps in a disease cycle. | 4+6=10 |
| 3. Write short notes on:
a) Methods of transfection to create transgenic animals.
b) Creation of golden rice. | 5+5=10 |
| 4. Explain in detail the process of bioethanol production. | 10 |
| 5. Explain the formation of soil. Describe the soil profile with a diagram. | 10 |
| 6. Explain soil respiration and regulation of soil respiration. Write a brief note on microbial production of methane in soil. | 5+5=10 |
| 7. Describe hemicellulose degradation with the enzymes responsible for mineralization. Explain the process of nitrogen mineralization. | 5+5=10 |
| 8. Write short notes on:
a) Difference between symbiotic and non-symbiotic biofertilizers.
b) Mechanism of action of PGPRs. | 5+5=10 |

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