PART - II

Answer ***any four*** questions [5 ×4=20]

12. There are a two-way relationship between mycorrizzal fungi and the plant host. Please explain with examples. List three major differences between arbuscular mycorrizae and ectomycorrhizae. 2+3

13. "Microorganisms contribute greatly to the sulfur cycle".... please explain with schematic diagram with examples. 5

14. What is difference between assimilatory nitrate rediction and denitrification ? Which reactions is performed mainly by microbes and which one is a more specialized in metabolic capacity. 3+2

15. Describe the type of microbes-microbe is interactions with examples. 5

16. How doses commensalism differ from cooperation and mutualism. In which of the above-mentioned processes, nitrification is a good example and why ? 3+2

17. Describe some possible effects of endophytic bacteria on plants. List the differnces between endophyte and microrizae. 3+2

Ex/MSBT/1/1/53/2019

M. Sc. Bio-Technology Part I Examination, 2019

Microbiology

Paper - I

Time : Four hours Full Marks : 100

PART - I

Answer ***any eight*** questions [8 ×10=80]

1. a) Prokaryotes are the 'dominant life form' on earth—explain.

   b) Mention the major contribution of Sambhu Nath De, Sir Upendra Nath Brahmachari, Paul Ehrlich, Charles Laveran, and Sir Ronald Ross. in microbiology. 5+5=10

2. a) Compare the structures of Gram positive and Gram negative bacteria.

   b) Give schematic design of experiments to separate both organisms from a mixture of *Escherichia coli* and *Staphylococcus aureus.* 5+5=10

3. a) Even *E. coli* has a short term memory—Explain in the light of bacterial chemotaxis.

   b) Give schematic design of experiments to demonstrate bacterial chemotaxis. 5+5=10

4. a) How bacteria are classified based on their requirement of (a) temperature, (b) oxygen, (c) pH, (d) Carbon and (e) energy sources [2+2+2+(2+2)=10]

5. a) Briefly describe the method for "pasteurization" of milk; does the method sterilize the milk ? Why you think "pasteurization" works ?

   b) What are the desirable properities of an ideal antibiotic ?

   [(3+1+1)+5=10]

6. a) Describe different methods that could be used to monitor the growth of bacteria.

   b) It is said that only about 1% of bacteria present in soil could be cultured-what exactly is meant by the statement? Suggest experiment to prove or disprove it. [5+5]

7. a) Nitrogenase enzyme is usually oxygen sensitive—Explain how different nitrogen fixing bacteria protect their nitrogenase from oxygen inactivation.

   b) Bacterial photosynthesis are mostly anoxygenic—explain.

   [5+5=10]

8. a) What are the impacts of endospore forming bacteria in microbiology ?

   b) How and why the vaccination protocol of USA differs from that on in INDIA ?

   c) What is pulse polio vaccination ? Is it safe ? Explain.

   [5+2+(2+1)=10]

9. a) Briefly discuss the Baltimore classification of virus.

   b) What are the special properties of H1N1 virus ?

   c) Mention the special features of myeoplasma.

   [4+3+3=10]

10. a) Discuss briefly the methods of bacterial and yeast cell lysis.

    b) What are the special fratures of Sabouraud's media to grow yeast and mold ?

    c) Discuss the structure and function of bactrial LPS.

    [(2+2)+2+(2+2)=10]

11. Write short notes on ***any two*** of the following : [2 ×5=10]

    i) Interferon

    ii) Protozoan diseases

    iii) Bacterial classification

    iv) Algae

    v) Methanogenesis

    vi) Tuberculosis management

    vii) Special Properties of bacteriorhodopsin

    viii) Fermentation