B.Sc. (Part-III) (Semester-V) Examination

5S-MICROBIOLOGY

(Environmental Microbiology and Bioinstrumentation)

Time—Three Hours] [Maximum Marks—80

Note :— (1) All questions are compulsory.

(2) Draw diagrams wherever necessary.

1. (A) Fill in the blanks : 2

(i) The causative agent of pulmonary tuberculosis is _____.

(ii) The chlorine which is left in water after satisfying Cl_2 demand of water is known as _____.

(iii) The bacteria _____ are present in root modules of leguminous plants.

(iv) Formation of Schumtzdeck layer occurs in _____ filter.

(B) Choose correct alternative : 2

(i) A horizon is related to :

(a) Soil profile

(b) Water profile

(c) Air

(d) None

(ii) The long form of MPN is _____ of coliforms per 100 ml.

(a) Moist pressure number
(b) Most probable number
(c) Mean probable number
(d) Most pressure number

(iii) _____ is an association between two organisms in which one organism is benefited and other remains unaffected.

(a) Synergism
(b) Symbiosis
(c) Commensalism
(d) Parasitism

(iv) Settling plate device is an example of _____ method.

(a) Liquid impingement
(b) Solid impingement
(c) Gas impingement
(d) Vapor impingement

(C) Answer in **ONE** sentence : 4

(i) Define chlorination.
(ii) Name the medium used in presumptive test for detection of faecal steptococci.
(iii) Define biopesticide.
(iv) Define activated sludge.

(c) Discuss the concept of biochemical oxygen demand (BOD). 4

OR

(d) Explain :

(i) Biological layer of slow sand filter
(ii) Activated sludge. 4

(e) Enlist methods of chlorination. Discuss any one method. 4

(f) Discuss sewage treatment by trickling filter method. 4

7. Define chromatography. Describe in detail principle and applications of paper and thin layer chromatography. 12

OR

Define electrophoresis. Describe in detail principle and applications of Paper and Gel electrophoresis. 12

2. (a) Illustrate antagonism with suitable example. 4

(b) Describe sampling of air by settling plate device. 4

(c) Explain control of airborne microorganisms by UV irradiation. 4

OR

(d) Describe synergism with suitable example. 4

(e) Discuss sampling of air by Bead bubbler device. 4

(f) Describe etiology and symptoms of any one viral airborne disease. 4

3. Describe symbiotic nitrogen fixation in detail. 12

OR

Define rhizosphere. Describe the microbiology, formation and functions of humus in detail. 12

4. (a) Define :

(i) Planktons

(ii) Eutrophication. 4

(b) Give any four beneficial activities of Planktons. 4

(c) Discuss "Blackout algae" method for planktons control. 4

OR

(d) Discuss any four harmful activities of Planktons. 4

(e) What is influence of temperature and depth on growth of Planktons ? Explain. 4

(f) Describe any two methods to remove color odor produced by Planktons. 4

5. (a) Why pathogenic organisms are not detected to determine the sanitary quality of water ? Explain. 4

(b) Discuss the advantages of membrane filter technique. 4

(c) Differentiate between faecal and nonfaecal coliforms. 4

OR

(d) Explain :

(i) MPN

(ii) Coliforms. 4

(e) Describe confirmed test for coliforms. 4

(f) Discuss multiple tube fermentation technique for faecal streptococci. 4

6. (a) Draw the schematic diagram of Rapid sand filter. 4

(b) Explain breakpoint chlorination. 4