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

5S : MICROBIOLOGY

(Environmental Microbiology and Bioinstrumentation)

Time : Three Hours] [Maximum Marks : 80

N.B. :— (1) Question No. **1** is compulsory and carries **8** marks without any internal choice.

(2) Question Nos. **2** to **7** carry equal marks with internal choice.

(3) Draw neat and labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

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

(ii) Andersen air sampler is an example of _____ impingement device.

(iii) The chlorine left in water after satisfying chlorine demand is known as _____.

(iv) _____ is a faecal type of coliform organism. 2

(B) Choose the correct alternative :

(i) Swine flu is a _____ disease.

(a) Water borne (b) Air borne

(c) Vector borne (d) Venereal

(ii) The end products of Proteolysis are _____.

(a) CHO (b) Cl_2

(c) Lipids (d) Amino acids

(iii) Slow sand filter is a _____ type of filter.

(a) Mechanical (b) Biological

(c) Aerobic (d) Anaerobic

(iv) Long form of WHO is :

(a) White Health Organ (b) World Health Organization

(c) Wild Health Organ (d) World Hygiene Organization 2

(C) Answer in **one** sentence each :

(i) Define Coliforms.

(ii) Name any two chlorine compounds.

(iii) Define biofertilizer.

(iv) Define Sewage. 4

2. (a) Define Symbiosis. Illustrate with suitable example. 4

(b) Explain the working of Lemon's air sampler. 4

(c) Discuss the control of microorganisms in air by UV light. 4

OR

(d) Discuss antagonism with suitable example. 4

(e) Discuss the etiology and symptoms of any one viral air borne disease. 4

(f) Explain the working of Laminar air flow system in brief. 4

3. Describe symbiotic nitrogen fixation in detail. 12

OR

Discuss formation, functions and microbiology of humus. 12

4. (a) Explain :
   (i) Zooplankton
   (ii) Blacking out algae. 4
   (b) Discuss beneficial characteristics of Planktons. 4
   (c) Describe any one method for removal of undesirable color, odor and taste caused by Planktons. 4

OR

   (d) Explain :
   (i) Phytoplanktons
   (ii) Importance of covering of reservoir. 4
   (e) Give any four undesirable features of Planktons. 4
   (f) Explain activated carbon method for removal of undesirable colour, odor and taste. 4

5. (a) Give ideal characteristics of E-coli as an indicator of faecal pollution. 4
   (b) Describe membrane filter technique for detection of faecal streptococci. 4
   (c) Give ICMR bacteriological standards for treated water. 4

OR

   (d) Describe presumptive test for coliforms. 4
   (e) Differentiate between faecal and non-faecal coliforms. 4
   (f) Discuss multiple tube dilution technique for faecal streptococci. 4

6. Draw flowsheet diagram of water treatment plant. Explain Rapid Sand Filter in detail. 12

OR

Draw flowsheet diagram of sewage treatment plant. Explain activated sludge process in detail. 12

7. (a) Define spectroscopy. Give applications of UV spectroscopy. 4
   (b) Enlist types of electrophoresis. Discuss any one type of electrophoresis in brief. 4
   (c) Explain Isotopic tracer technique in brief. 4

OR

   (d) Discuss the principle and method of paper chromatography. 4
   (e) Give applications of gel electrophoresis. 4
   (f) Discuss applications of Thin layer chromatography. 4