ENV-11 **Roll No.** | | | | | | | | | | |

M. TECH.
(SEM I) ODD SEMESTER EXAMINATION, 2015-16
ENVIRONMENTAL CHEMISTRY AND MICROBIOLOGY

[Time:-3 Hours] [Max Marks: 100]

Note: Attempt All Questions. All Questions carry equal marks:-

Q.1. Attempt any two parts of the following: [10x2]

(a) Explain generalized gas law, Dalton's law of partial pressure and Henry's law along with its environmental significance.

(b) Explain vapour pressure of liquids. How this is used in environmental engineering?

(c) Differentiate between hydrophilic and hydrophobic colloids and explain electro-kinetic properties of colloids with special reference to zeta potential.

Q.2. Attempt any two parts of the following: [10x2]

(a) Describe free energy and its significance and use in environmental engineering.

(b) What do you mean by binary mixtures? Explain case II and case III for binary mixtures.

(c) Describe effect of temperature and pH on biochemical processes. How they are used in the design and operation of biological waste treatment facilities?

Q.3. Attempt any two parts of the following: [10x2]

(a) Enumerate various water quality parameters and also explain the importance of water quality parameters: Chlorides, heavy metals, Fluorides and Pathogens in drinking water.

(b) Disposal of the large quantities of bacteria produced during waste treatment is one of the most significant problems in environmental engineering. Explain why this particular problem might be minimized by anaerobic rather than aerobic waste treatment?

(c) What do you understand by colour and turbidity in water? What are the measurement methods of colour and turbidity? Explain the permissible limits of them and the environmental significance of them.

Q.4. Attempt any two parts of the following: [10x2]

(a) Discuss why it is desirable to maintain a significant dissolved oxygen concentration in river and stream. Also explain the important precautions required to be taken if biological examination of water is to be conducted.

(b) Discuss the thermodynamics of microbial systems for aerobic and anaerobic conditions.

(c) Describe energy balance in microbial system giving suitable examples.

Q.5. Write short notes on any four parts of the following: [5x4]

(a) Biochemical Oxygen Demand.

(b) Classification of solids and their significance.

(c) Reverse Osmosis.

(d) Breakdown process of polysaccharides.

(e) Genetically engineered microorganism.

(f) Chemical Oxygen Demand.