Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

 Roll No .....

MTEE-101

M.E./M.Tech. I Semester

Examination, June 2017

Environmental Chemistry

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume suitable data, if necessary.

1. a) Explain balancing chemical equation and solubility product. 7
   b) A sample of H_2 was prepared in the laboratory by the reactions $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$. 456ml of gas was collected at 22.0 °C. The total pressure in the flask was 742 torr. How many moles of H_2 were collected? The vapor pressure of H_2O at 22.0 °C is 19.8 torr. 7

2. a) Explain the Equilibrium and Le chatelier's principle. 7
   b) If 3g of acetic acid (HAC = CH_3COOH) is added to enough distilled water to make 1 litre of solution, what will be the acetate ion concentration? 7

3. a) Differentiate between chemical adsorption, exchange adsorption, and physical adsorption. 7
   b) Explain in detail the processes of Osmosis and Dialysis. 7

4. a) Explain the temperature dependence of reaction rates catalysis. 7
   b) A solution containing 34 mg/l (.001M)H_2S is titrated with a strong NaOH solution. Calculate the pH at the beginning the mid-point and the equivalence point for the first ionization of the acid. Assume no H_2S interchange with the atmosphere. 7

5. a) Explain with curves, titration of weak acids and bases. 7
   b) Explain biochemistry involved with carbohydrates for synthesis of fats and proteins as well as for energy and building cell tissue. 7

6. a) What is the difference between alpha, beta and gamma radiations. 7
   b) Describe briefly the 'somatic' and 'genetic' effects of radiations on humans. 7

7. a) Explain the Turbidity and its measurement. 7
   b) What is the difference between Lamberts law and Beer's law. 7

8. Write short notes on any four of the following: 4×3½=14
   a) Oxidation - reduction equation
   b) Ion activity coefficient
   c) Stable and radioactive nuclides
   d) Use of colorimeters
   e) Chlorine demand test
   f) Sulphate determination

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