Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- Vth SEMESTER–EXAMINATION – MAY/JUNE - 2012

Subject code: 150603 Date: 04/06/2012

Subject Name: Environmental Engineering

Time: 02:30 pm – 05:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Differentiate between: (i) BOD & COD (ii)Aerobic & anaerobic decompositions of wastewater. **07**

(b) If the 5 day BOD at 20^0 C temperature of a waste water sample is found to be 160 mg/l, find 2 day BOD at 30^0 C temperature of the same sample. Assume $K_{D\,(20)} = 0.1$/day. **07**

Q.2 **(a)** Classify the solid waste and describe in detail mechanical composting method. **07**

(b) Explain how nitrogen compounds can help in understanding the type and state of organic matters present in the water. **07**

OR

(b) Explain the term Population Equivalent. Discuss the various purposes of determining it. **07**

Q.3 **(a)** State and explain the characteristics of waste from a paper & pulp industry. **07**

(b) State the different components of house drainage system and describe any two of them in detail. **07**

OR

Q.3 **(a)** What is air pollution? Explain in detail its effects on property and materials. **07**

(b) What is noise pollution? State the sources of it and list the major effects of the noise pollution. **07**

Q.4 **(a)** State the role of microbes in the environment. Write a note on the membrane filter technique of water. **07**

(b) What control measures should be taken to prevent the outbreak of water borne diseases? **07**

OR

Q.4 **(a)** Explain the term `Alkalinity` of water sample. Describe the Laboratory procedure for the measurement of it. **07**

(b) (i)What are the applications of Alkalinity data in Environmental Engineering practices? **07**

(ii) A water sample had a caustic alkalinity (OH^-) of 75 mg/l, total alkalinity 250 mg/l and total hardness of 320 mg/l all as $CaCO_3$. Calculate the various forms of alkalinity present and the amounts of non-carbonic hardness, if any in this sample. Also guess the pH value of this sample.

Q.5 **(a)** Discuss briefly the process of self purification of natural receiving water. Explain the Oxygen Sag curve with sketch. **07**

(b) The domestic sewage of a town is to be discharged into a stream after treatment. Determine the maximum permissible effluent BOD of the waste and the degree of treatment required in the treatment plant. Given the following data: **07**

(i) Population of town = 1, 00,000.
(ii) D.W.F. Of sewage = 160 lit/capita/day.
(iii) BOD contribution per capita = 0.075 kg/day.
(iv) Minimum flow of stream = 0.25 m^3/s.
(v) BOD of stream = 3 mg/l.
(vi) Maximum BOD of stream at d/s = 6 mg/l.

OR

Q.5 Write Short Notes (Any Four): **14**

(i) MPN test.
(ii) Relative Stability of waste water.
(iii) Sewage sickness.
(iv) Phosphorous cycle of decomposition.
(v) Environmental Audit.

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