

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- V<sup>th</sup> 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 **07**  
(ii) Aerobic & anaerobic decompositions of wastewater.

**(b)** If the 5 day BOD at 20<sup>0</sup> C temperature of a waste water sample is found to be 160 mg/l, find 2 day BOD at 30<sup>0</sup> C temperature of the same sample. Assume  $K_{D(20)} = 0.1/\text{day}$ . **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 ( $\text{OH}^-$ ) of 75 mg/l, total alkalinity 250 mg/l and total hardness of 320 mg/l all as  $\text{CaCO}_3$ . 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<sup>3</sup>/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):

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

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