

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2018****Subject Code:2141302****Date:05/12/2018****Subject Name:Environmental Sciences II****Time: 02:30 PM TO 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.

MARKS

- Q.1 (a)** State the Principle of Schulze-Hardy rule. Discuss it's significance in wastewater treatment. **03**
- (b)** In a BOD determination, 6 ml of wastewater are mixed with 294 ml of diluting water containing 9.1 mg/L of dissolved oxygen. After a 5-d incubation at 20°C, the dissolved oxygen content of the mixture is 2.8 mg/L. Calculate the BOD of the wastewater. Assume that the initial dissolved oxygen of wastewater is zero. **04**
- (c)** Define and Differentiate between BOD and COD. **07**
- Q.2 (a)** Explain the Principle of Osmosis and Reverse Osmosis with neat sketch. **03**
- (b)** Derive the equation for Ultimate BOD. **04**
- (c)** Enlist the reagents are used in determination of COD. Highlight the importance of each along with reaction chemistry. **07**
- OR**
- (c)** Discuss the significance of DO in wastewater treatment. Explain the modified Winkler method with reaction chemistry. **07**
- Q.3 (a)** Define the following terms: i. Sol ii. Smog iii. Emulsion **03**
- (b)** i. In determination of phenolphthalein acidity color change appears from ____ to ____ at ____ pH. **04**
- ii. Which organic substances are not oxidized in COD test?
- iii. Which chemical is used to eliminate the interference caused by nitrifying bacteria in BOD?
- iv. Write the end point color change in titration of Sulphate and COD analysis.
- (c)** Determine the theoretical COD of the following compounds in mg/L in wastewater sample: (i) 2500 mg/L of Acetic Acid (ii) 500 mg/L of Glucose **07**
- OR**
- Q.3 (a)** Define Primary Alcohol, Secondary Alcohol, Tertiary Alcohol with example. **03**
- (b)** Enlist and Explain different types of Acidity. Highlight their Environmental Significance. **04**
- (c)** Calculate the % saturation of DO in water sample with a temperature of 22°C and a DO concentration of 5.3 mg/L when the atmospheric pressure is 1 atm. Assume the sample salinity is less than 100 mg/L. **07**
- Q.4 (a)** Explain kinetic approach of Chemical Equilibrium. **03**
- (b)** Explain procedure to measure oil & Grease by solvent extraction method. **04**
- (c)** Enlist the General Properties of colloid. Explain the following Properties in detail (i) Tyndall effect (ii) Brownian movement **07**
- OR**
- Q.4 (a)** Discuss the Significance of Colloids in Environmental Engineering. **03**
- (b)** Briefly describe the Environmental Significance of Sulphates. **04**

- www.FirstRanker.com

- OR**

- ii. Oil & Grease
