Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- IV$^{th}$ SEMESTER–EXAMINATION – MAY/JUNE- 2012**

**Subject code: 141302** **Date: 25/05/2012**

**Subject Name: Environmental Sciences-II**

**Time: 10:30 am – 01:00 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)** What is the basic difference between COD and BOD. **07**

**(b)** Determine the theoretical COD of following compound in mg/l? **07**
(i) 1000 mg/l Glucose
(ii) 1200 mg/l Acetic Acid

**Q.2** **(a)** Explain the kinetic approach of chemical equilibrium. **07**

**(b)** Calculate the H+ ion concentration and $P^H$ for 0.001 M solution of $HNO_2$. Assume Ka= $5.9x10^{-4}$ **07**

**OR**

**(b)** Explain the principle of Solvent Extraction. **07**

**Q.3** **(a)** The solubility product Ksp for cadmium hydroxide is $5.9x10^{-15}$Determine the solubility in mg/l of cadmium hydroxide in water at $25^0$C. **07**

**(b)** Explain the common ion effect with appropriate example. **07**

**OR**

**Q.3** **(a)** Write a short note on Dialysis. **07**

**(b)** Give the difference between **07**
(i) Ionization and dissociation
(ii) Homogeneous chemical equilibrium and Heterogeneous chemical equilibrium

**Q.4** **(a)** What is importance of $P^H$ for determination of Chloride? Explain in detail. **06**

**(b)** Give the role of following chemicals in COD determination: **08**
(i) $K_2Cr_2O_7$
(ii) $H_2SO_4$
(iii)$HgSO_4$
(iv) Ferrous Ammonium Sulfate (FAS )

**OR**

**Q.4** **(a)** Write the public health significance and sources of Acidity. **07**

**(b)** Enlist sources of grease in domestic wastewater. **07**

**Q.5** **(a)** Write chemical equations involved in Unmodified Winkler Method. **07**

**(b)** Enlist requirements which must be complied with in order to obtain reliable BOD data. **07**

**OR**

**Q.5** **(a)** Give the difference between Aliphatic and Aromatic compounds biodegradability point of view. **07**

**(b)** What functional group is characteristic of each of the following: Alkenes, alcohol, aldehydes, ketons, acids, amines, aromatic compounds ? **07**

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