

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 140501**Date: 27/12/2012****Subject Name: Physical and Inorganic Chemistry****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

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

- Q.1** (a) Answer the following : 07
1. What do you understand by the term “component”.
 2. Define Baker-Nathan effect.
 3. Differentiate between exothermic and endothermic reaction.
 4. What is roll of “salt bridge”?
 5. What do you meant by HPLC ?
 6. Distinguish between Transitional and Nontransitional elements.
 7. Classification of Explosives.
- (b) What is Phase rule?.Describe phase diagram of Triple point of one Component system. 07
- Q.2** (a) Define the term “Chromatography” ? Explain the principle of gas Chromatography technique with a neat schematic diagram of Instrument and write it's Application, Advantages and Disadvantages. 07
- (b) What is Electrochemical cell ? Explain with suitable diagram and write net cell reaction of Weston Standard Cadmium cell. 07
- OR**
- (b) Explain the principle of Infrared Spectroscopy technique with a neat diagram of Instrument and write it's application. 07
- Q.3** (a) Define and Explain with suitable example of Inductive effect, Resonance effect and Steric effect of electron displacement. 07
- (b) What is Reactive intermediate? Describe with example of Hyper conjugation. 07
- OR**
- Q.3** (a) What do you meant by Bond fission? Define and explain with properties of Covalent, Co-ordinate and Ionic bonds. 07
- (b) Compare and Describe the Valence Bond (VB) and Molecular Orbital (MO) theory of bonding. 07
- Q.4** (a) What is Calorimetry? Measurement of the heat of reaction by water calorimeter and Bomb calorimeter. 07
- (b) What is Thermochemistry? Describe the Kirchoff's Equation for effect of Temperature and Pressure in chemical reaction with change in Enthalpy, Entropy and Free energy. 07

OR

- Q.4** (a) Define and Classification of Rocket propellant. Describe with reason why Bipropellant is more widely used in a Rocket? 07
- (b) What is Explosive? Discuss any two manufacturing process of explosives and write the precautions during the storage of explosives, 07
- Q.5** (a) What do you meant by Metallurgy? Write the properties and applications of steel alloys and Non ferrous alloys. 07
- (b) Describe with neat diagram of the Froth flotation process and Electromagnetic separation process for Ore dressing. 07
- OR**
- Q.5** (a) Explain Buffer capacity. Describe Hydrogen - Oxygen fuel cell with schematic diagram and write the net cell reaction. 07
- (b) What is Conductometry? Explain and write the application of conductometric analysis. 07
