

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- IVth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 140501****Date: 23/05/2012****Subject Name: Physical and Inorganic Chemistry****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) Answer the following: **07**
- i) What do you understand by the term “ degree of freedom” ?
 - ii) Write down structural formula of RDX.
 - iii) Define carbonium ion.
 - iv) Give the region of visible range.
 - v) Give the principle of thermo gravimetric analysis
 - vi) What is pH?
 - vii) Enlist various types of batteries.
- (b) What are alloys? Classify alloys with suitable examples giving their applications. **07**
- Q.2** (a) The standard heat of formation at 298 K for $\text{CCl}_{4(g)}$, $\text{H}_2\text{O}_{(g)}$, $\text{CO}_{2(g)}$ and $\text{HCl}_{(g)}$ are -25.50, -57.80, -94.10 and -22.10 kcal/mole respectively. Calculate ΔH° for the reaction **07**
- $$\text{CCl}_{4(g)} + 2 \text{H}_2\text{O}_{(g)} \rightarrow \text{CO}_{2(g)} + 4\text{HCl}_{(g)}$$
- (b) Explain molecular orbital theory with suitable illustrations. **07**
- OR**
- (b) Explain Lambert-Beers law. Also explain chromatography with labeled diagrams. **07**
- Q.3** (a) Explain eutectic systems. Also explain two component systems of lead – silver. **07**
- (b) What is metallurgy? Explain various heat treatments of steel. **07**
- OR**
- Q.3** (a) Explain Co-ordination bonding. Explain hydrogen bonds with their type and examples. **07**
- (b) Explain Handerson – Hasselbatch equation for buffer solutions. **07**
- Q.4** (a) Explain following terms with suitable illustrations. **07**
- i) Inductive effect
 - ii) Resonance
- (b) Explain following terms with suitable illustrations. **07**
- i) UV spectroscopy
 - ii) Conductometric analysis
- OR**
- Q.4** (a) Write short note with illustrations **07**
- i) Isomerism
 - ii) Physical properties of metals.

- (b) Write short note with illustrations **07**
i) Hess's law of constant heat summation
ii) Standard hydrogen electrode with diagram
- Q.5** (a) What are explosives? Classify them and give properties of explosives. How will you prepare PETN or TNT. **07**
(b) What are propellants? Classify and give at least two points of difference between the types of propellants. **07**
- OR**
- Q.5** (a) Explain transitional and non transitional elements in details. **07**
(b) Explain entropy and free energy for thermo-chemical reaction **07**
