

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV • EXAMINATION – WINTER • 2014

Subject Code: 140501

Date: 22-12-2014

Subject Name: Physical and Inorganic Chemistry

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) Brief in short **07**
1. Define Liquid Crystals.
 2. Write the structure of Lead Azide.
 3. Give Principle of Chromatography.
 4. Explain the term Brittleness in metal.
 5. Give the importance of Phase rule.
 6. Define 'Cell Constant'.
 7. What is buffer capacity?
- (b) Explain following: **07**
- (i) Electro negativity
 - (ii) Any two properties of metals
 - (iii) Internal Energy
 - (iv) Principle of IR
 - (v) Two alloys of Nickel
 - (vi) Visible range
 - (vii) Nernst equation
- Q.2** (a) Explain the Principle of Spectroscopy. Brief with schematic diagram UV-Visible Spectroscopy. **07**
- (b) Explain the importance of different properties of metals. To get the desire quality of steel which properties is to be taken care of along with the ingredients. **07**
- OR**
- (b) Explain in brief different methods for heat treatment to get the variable Steels. **07**
- Q.3** (a) What is Phase rule and define terms used in it. What is triple point and explain one component system in detail with one example. **07**
- (b) Define Inductive, Mesomeric (Resonance) and Electromeric effects. **07**
- OR**
- Q.3** (a) Write Preparation, properties of followings. **07**
- (i) Cellulose Nitrate
 - (ii) TNT
 - (iii) PETN
 - (iv) Cyclonite.
- (b) Explain different types of Electrodes Glass, Calomel and Platinum. **07**
- Q.4** (a) Explain: **07**
- (a) Two component system and determine eutectic point.
 - (b) Steric Effect and Hyper Conjugation.
- (b) Define heat of reaction. Derive Kirchoff's equation considering all the parameters. **07**
- OR**
- Q.4** (a) Define pH. Explain Lamberts Beers law and show its importance in UV-Visible Spectroscopy. **07**
- (b) Explain in detail different types of chemical bonds with at least two examples in each. **07**
- Q.5** (a) Explain the importance of Alloys? Discuss different types of Ferrous and Non Ferrous Alloys. **07**

- (b) What is Rocket Propellant? Give the importance of the usage of Bipropellant in a Rocket. 07

OR

- Q.5** (a) Explain Valence and Molecular theory of bonding. 07
(b) What is Specific Conductance? Explain in detail with graph the reaction of Strong Acid/Strong Base, Strong Acid/Weak Base, Weak Acid/Weak Base. 07
