GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV • EXAMINATION – SUMMER 2013

Subject Code: 140501

Subject Name: Physical and Inorganic Chemistry

Time: 10:30am – 01:00pm

Total Marks: 70

07

07

07

Date: 07-06-2013

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) What is phase rule? Draw the phase diagram of water and discuss its main 07 features.
 - (b) What are explosives? Explain the classification of explosives giving suitable 07 examples. What are the precautions to be taken while storing explosives?
- Q.2 (a) Discuss heat treatment of steel. What are physical properties of metals?
 - (b) What is chromatography? Giving neat and well labeled diagram, explain 07 principle and working of gas chromatography.

OR

- (b) Explain ionic and covalent bond taking suitable example. Discuss properties of 07 ionic and covalent compounds.
- Q.3 (a) Define the terms: (a) Heat of Neutralization (b) Heat Combustion (c) Heat 07 of formation.
 Calculate Heat of formation of ethanol given that heat of combustion of ethanol is -1368.5 kJ and Heat of formation of CO₂ (g) and H₂O (l) respectively are -

393..5 kJ and -286.3 kJ respectively.

(b) Write a short note on: (a) Fuel cell (b) Industrial importance of pH

OR

- Q.3 (a) What do you understand by Galvanic cell? Define and differentiate between 07 primary and secondary batteries taking suitable examples.
 - (b) Discuss: (a) Hess's Law (b) Kirchoff's equation
- Q.4 (a) Give a brief account of buffers. What are different types of buffers? Derive 07 equation for pH of acidic buffers.
 - (b) What are rocket propellants? Discuss different types of propellants giving 07 example.

OR

- Q.4 (a) Write preparation of following explosives: 07 (i) TNT (ii) PETN (iii) RDX
 - (b) What do you understand by spectroscopy? Write in brief about the principle 07 and working of UV-VIS spectrophotometer.
- Q.5(a) Define: (i) Carbocation (ii) Lewis acid (iii) resonance07(iv) Inductive effect (v) Metal alloy07
 - (b) What do you understand by salt hydrolysis? Derive formula for pH of salt of 07 weak acid and strong base.

OR

- Q.5 (a) Define: (i) Entropy (ii) Enthalpy (iii) Degree of freedom (iv) Eutectic point (v) 07 Coordination bond
 - (b) What is hydrogen bond? Differentiate between intermolecular and intra 07 molecular hydrogen bonding and explain their effect on properties of compounds.
