

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV • EXAMINATION – SUMMER 2013****Subject Code: 140501****Date: 07-06-2013****Subject Name: Physical and Inorganic Chemistry****Time: 10:30am – 01:00pm****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 phase rule? Draw the phase diagram of water and discuss its main features. **07**

**(b)** What are explosives? Explain the classification of explosives giving suitable examples. What are the precautions to be taken while storing explosives? **07**

**Q.2 (a)** Discuss heat treatment of steel. What are physical properties of metals? **07**

**(b)** What is chromatography? Giving neat and well labeled diagram, explain principle and working of gas chromatography. **07**

**OR**

**(b)** Explain ionic and covalent bond taking suitable example. Discuss properties of ionic and covalent compounds. **07**

**Q.3 (a)** Define the terms: (a) Heat of Neutralization (b) Heat of Combustion (c) Heat of formation. **07**

Calculate Heat of formation of ethanol given that heat of combustion of ethanol is -1368.5 kJ and Heat of formation of CO<sub>2</sub> (g) and H<sub>2</sub>O (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 **07**

**OR**

**Q.3 (a)** What do you understand by Galvanic cell? Define and differentiate between primary and secondary batteries taking suitable examples. **07**

**(b)** Discuss: (a) Hess's Law (b) Kirchoff's equation **07**

**Q.4 (a)** Give a brief account of buffers. What are different types of buffers? Derive equation for pH of acidic buffers. **07**

**(b)** What are rocket propellants? Discuss different types of propellants giving example. **07**

**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 and working of UV-VIS spectrophotometer. **07**

**Q.5 (a)** Define: (i) Carbocation (ii) Lewis acid (iii) resonance **07**  
(iv) Inductive effect (v) Metal alloy

**(b)** What do you understand by salt hydrolysis? Derive formula for pH of salt of weak acid and strong base. **07**

**OR**

**Q.5 (a)** Define: (i) Entropy (ii) Enthalpy (iii) Degree of freedom (iv) Eutectic point (v) Coordination bond **07**

**(b)** What is hydrogen bond? Differentiate between intermolecular and intramolecular hydrogen bonding and explain their effect on properties of compounds. **07**

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