Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) • EXAMINATION – WINTER 2016

Subject Code:2140501 **Date:24/11/2016**

Subject Name:Physical And Inorganic Chemistry

Time:02:30 PM to 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		**Short Questions**	**14**
	1	State phase rule and write its mathematical formula also.	
	2	Give example of Pseudomolecular reaction.	
	3	State basic principle of Chromatography.	
	4	What are Explosives?	
	5	Define the word Buffer Solution and State its types also.	
	6	Give two points of difference between Nuclear Fusion and Nuclear Fission.	
	7	State 4 important properties of Metal.	
	8	State type of hybridization in Methane, Ethene and Ethyne.	
	9	What do you mean by Hydrogen bond?	
	10	State First law of Thermodynamics.	
	11	Draw neat and labeled basic block diagram of spectrophotometer.	
	12	Calculate bond order of H_2 molecule.	
	13	State the units of Rate of reaction, Half life period of first order	
	14	Define the word metallurgy.	
Q.2	**(a)**	Describe the process of ore dressing by Froth flotation.	**03**
	(b)	Write a note on radioactive decay.	**04**
	(c)	Explain Handerson – Hasselbatch equation for buffer solutions.	**07**
		OR	
	(c)	Explain Hess's law of constant heat summation, with a suitable example.	**07**
Q.3	**(a)**	Draw the phase diagram of water system. Discuss its salient features.	**03**
	(b)	With a neat block diagram of thermogravimetry apparatus, explain thermogravimetric analysis (TGA) by giving a suitable illustration.	**04**
	(c)	Discuss in detail about heat treatment of steel.	**07**
		OR	
Q.3	**(a)**	Classify explosives with suitable examples.	**03**
	(b)	Compare valence bond (VB) and molecular orbital (MO) theories of bonding.	**04**
	(c)	(i)State different types of electrodes. (ii) Write a short note on calomel electrode.	**07**
Q.4	**(a)**	Compare the properties of α , β and γ particles.	**03**
	(b)	What is chromatography? Explain HPLC giving neat and well labeled diagram.	**04**
	(c)	Derive the rate equation for the first order reaction and show that: (i)Half-life is independent of initial concentration. (ii)The rate constant is independent of concentration.	**07**

OR

Q.4	**(a)**	Write the precautions during the storage of explosives.	**03**
	(b)	What are the methods of detection and measurement of radioactivity? Explain any one in detail	**04**
	(c)	Compare the properties of ionic compounds and covalent compounds. Give various steps involved in Born- Haber cycle for the formation of NaCl crystal.	**07**
Q.5	**(a)**	What is Conductometry? Explain and write the application of conductometric analysis.	**03**
	(b)	Write about "Zero order reaction" by taking suitable example.	**04**
	(c)	State phase rule. Draw and explain phase diagram of Pb-Ag system.	**07**

OR

Q.5	**(a)**	Define the terms: Components, Phase and Degree of Freedom.	**03**
	(b)	Derive Kirchoff's equations representing the variation of heat change of reaction with temperature at constant volume and at constant pressure.	**04**
	(c)	Define and Classify Rocket propellant. Describe with reason why Bipropellant is more widely used in a Rocket?	**07**

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