Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2140501 **Date: 12/06/2017**

Subject Name: Physical And Inorganic Chemistry

Time: 10:30 AM to 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		**Short Questions**	**14**
	1	What do you understand by eutectic point?	
	2	Define component	
	3	Explain heat of combustion.	
	4	Name one instrument used for the measurement of heat of reaction.	
	5	What do you understand by zero order reaction?	
	6	What is cell constant?	
	7	State one application of differential thermal analysis (DTA).	
	8	Differentiate between fire and explosion.	
	9	State one propellant.	
	10	What do you understand by fusion reaction?	
	11	Define ionic bond.	
	12	Explain allotropy.	
	13	State one application of Nernst equation.	
	14	State the significance of phase diagrams.	
Q.2	**(a)**	State Beer – Lambert's law. What is its limitation?	**03**
	(b)	Derive Gibb's phase rule from thermodynamic considerations.	**04**
	(c)	Discuss the classifications, preparations and uses of explosives.	**07**
		OR	
	(c)	State the methods of detection and measurement of radioactivity. Explain anyone method with a neat diagram.	**07**
Q.3	**(a)**	What is the relationship between ΔH and ΔE? If the heat of formation of methane at constant pressure (ΔH) is – 17.9 kcal per mole at 25° C, what is its value at constant volume (ΔE)?	**03**
	(b)	State Hess's law of constant heat summation and explain any one of its applications.	**04**
	(c)	Write a short note on reference electrodes.	**07**
		OR	
Q.3	**(a)**	Differentiate between order of a reaction and molecularity of a reaction.	**03**
	(b)	Derive the rate equation for the first order reaction and show that half – life is independent of initial concentration.	**04**
	(c)	What is a nuclear reactor? With a neat diagram of light – water reactor, describe its main parts briefly.	**07**
Q.4	**(a)**	What is buffer solution? Explain how it works.	**03**
	(b)	What do you understand by radioactive decay? State its types and explain them briefly.	**04**
	(c)	Briefly describe the general metallurgical operations used for the extraction and purification of metals.	**07**
		OR	
Q.4	**(a)**	Explain the basic principle used in UV – Visible spectroscopy.	**03**
	(b)	Define specific conductance. Cite any one application of conductometry	**04**

and discuss briefly.

	(c)	Draw a neat phase diagram of one component water system. Discuss about its salient features by applying the phase rule.	**07**
Q.5	**(a)**	Estimate the pH of buffer solution containing 0.10 M sodium acetate and 0.03 M acetic acid. pK_a for acetic acid is 4.57.	**03**
	(b)	With illustrations, discuss the classification and application of propellants.	**04**
	(c)	What is the principle used in chromatography? Discuss the types and applications of chromatography technique.	**07**

OR

Q.5	**(a)**	Explain hydrogen bonding and its types with suitable examples.	**03**
	(b)	What is group displacement law of radioactivity? How does it throw light on the idea of radioactive isotopes?	**04**
	(c)	State the applications of copper. Discuss the important mechanical properties of metals.	**07**

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