GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2020

Subject Code:3130506   **Date:10/03/2021**

Subject Name:Applied Chemistry

Time:10:30 AM TO 12:30 PM   **Total Marks:56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Show the measurement of Boiling point Elevation.	**03**
	(b)	Define: Optical activity & Specific rotation. Order of reaction, Reaction rate.	**04**
	(c)	Explain the principle, instrumentation of Nuclear magnetic resonance spectroscopy.	**07**
Q.2	**(a)**	Explain the R, S System for Asymmetric Molecules.	**03**
	(b)	Define Term: Normality, Viscosity, Carbenes, Homolytic fission.	**04**
	(c)	Give the types of Organic reaction and discuss Nucleophillic Substitution (SN^2) reaction.	**07**
Q.3	**(a)**	Describe Heisenberg Uncertainty Principle	**03**
	(b)	Discuss SP^3 Hybridization with suitable example.	**04**
	(c)	Explain the Molecular Orbital Theory.	**07**
Q.4	**(a)**	Give the application of XRD.	**03**
	(b)	The heat of combustion of ethylene at 17° C and at constant volume is -332.19 kcal. Calculate the heat of combustion at constant pressure considering water to be in liquid state. (R = 2 cal degree^{-1} mol^{-1}).	**04**
	(c)	Draw the phase diagram of Zinc-Cadmium system. Describe its importance.	**07**
Q.5	**(a)**	Elaborate zero order reaction with suitable example.	**03**
	(b)	Define: Degree of freedom, Eutectic point, heat of combustion, Endothermic reaction.	**04**
	(c)	Draw the phase diagram of one component system and discuss its salient features.	**07**
Q.6	**(a)**	Discuss Pseudo order reaction.	**03**
	(b)	A solution of H_2O_2 when titrated against $KMnO_4$ solution at different time intervals gave the following results:	**04**

T(minutes)	0	10	20
Vol. of KMnO$_4$ used for 10 ml H$_2$O$_2$	23.8 ml	14.7 ml	9.1 ml

Selecting the above data, Show that the decomposition of H_2O_2 is a first order reaction.

	(c)	Explain mathematical expression for the rate constant of the second order reaction.	**07**

Q.7	(a)	What is the role of reinforcement in composites?	03
	(b)	Discuss the classification of ceramics with their general properties.	04
	(c)	Describe the each section of Scanning Electron Microscope.	07
Q.8	(a)	What are copolymers? Give its uses.	03
	(b)	Write a note on refractories with their uses.	04
	(c)	Explain with principle, instrumentation of mass spectroscopy.	07

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