Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 3130506 Date: 28/11/2019

Subject Name: Applied 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.**

			Marks
Q.1	**(a)**	Explain condensed system.	**03**
	(b)	Derive Gibbs phase rule thermodynamically.	**04**
	(c)	State the Hess law and illustrate with suitable examples.	**07**
Q.2	**(a)**	Describe: Liquid crystal	**03**
	(b)	Explain principle of Mass spectrometry	**04**
	(c)	Discuss the Phase diagram of Zn-Cd system.	**07**
		OR	
	(c)	Explain concept hybridisation with simple organic molecules	**07**
Q.3	**(a)**	Difference between the terms configuration and conformation.	**03**
	(b)	Derive Schrödinger wave equation.	**04**
	(c)	Discuss stereochemistry of tartaric acid.	**07**
		OR	
Q.3	**(a)**	Discuss the terms carbanion and free radical	**03**
	(b)	Explain mechanism of nucleophilic substitution	**04**
	(c)	Explain recemisation of optical isomers with suitable examples.	**07**
Q.4	**(a)**	Define: Degree of freedom and component	**03**
	(b)	A first order reaction is 10% completed in 20 minutes. How long will it take to be 70% complete?	**04**
	(c)	Explain pseudo order first reaction. Derive the equation for first order reaction.	**07**
		OR	
Q.4	**(a)**	Explain Heisenberg Uncertainty Principle	**03**
	(b)	Discuss the properties of insulators	**04**
	(c)	Discuss Parachor and Explain role of parachor in determining the chemical constitution of a compound	**07**
Q.5	**(a)**	Predict the NMR spectrum of CH_3 .CH_2.OH	**03**
	(b)	The heat of combustion of methane is -890.65kJ mol-1 and heat of formation of CO2 and H2O are -395.5kJ mol-1 and 286.0kJ.mol-1 respectively. Calculate the heat of formation of methane. (R=8.314J/degree.mol)	**04**
	(c)	Name any four important surface characterization techniques and explain any one technique in detail.	**07**
		OR	
Q.5	**(a)**	Define terms : (i) Order of reaction (ii) thermo chemistry	**03**
	(b)	Explain Florescence spectroscopy	**04**
	(c)	Discuss the properties and application of zeolites	**07**

****