Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2133502 Date: 30/11/2019

Subject Name: Analytical Techniques

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 terms QA & QC.	**03**
	(b)	Explain various factors affecting Rf value in paper Chromatography	**04**
	(c)	Discuss theory and instrumentation of HPLC.	**07**
Q.2	**(a)**	Enlist different types of errors.	**03**
	(b)	Define the term: TQM	**04**
	(c)	Explain Lambert Beer's law of absorption with derivation.	**07**
		OR	
	(c)	Write notes on Chemical shift, shielding, deshielding effect and spin-spin coupling.	**07**
Q.3	**(a)**	Write a short note on column preparation.	**03**
	(b)	Write a note on FID used in GC.	**04**
	(c)	Define the term: co-precipitation and post precipitation. Explain Gravimetric estimation of Ni.	**07**
		OR	
Q.3	**(a)**	Define the term: Stoichiometry	**03**
	(b)	Write a short note: Nitrogen rule.	**04**
	(c)	Write a short note on Finger print region. How will you distinguish Ethanol and dimethyl ether using IR spectrum?	**07**
Q.4	**(a)**	Enlist method of preparation of TLC plates.	**03**
	(b)	Define various ways of expression of concentration and its importance in analytical techniques	**04**
	(c)	An organic compound (molecular formula: $C_6H_{12}O_2$) exhibits the following spectral data: IR: 3330 cm-1(m), 3042 cm-1(m), 2862 cm-1(w), 1722 cm-1(s), 1405 cm-1 UV: λmax at 268 nm NMR: δ 1.1 (6H, singlet), 2.1 (3H,singlet), 2.6 (2H,singlet), 3.9 (1H, singlet) Deduce the structure of the compound.	**07**
		OR	
Q.4	**(a)**	How will you distinguish inter and intra-molecular hydrogen bonding using IR spectroscopy?	**03**
	(b)	Explain Spectroscopic behavior of p-hyhroxy benzoic acid.	**04**
	(c)	Analysis of sample gave following values of Cu content: 41.20, 41.33, 41.60, 41.37 and 41.27.Calculate the mean, median, standard deviation, coefficient of variance and range.	**07**
Q.5	**(a)**	Write the characteristic requisites for a solvent to act as mobile phase.	**03**
	(b)	Derivertisation is needed in GC - Justify the statement	**04**
	(c)	What is good laboratory practices? Explain in detail.	**07**
		OR	
Q.5	**(a)**	Define the term: Derivertization	**03**
	(b)	What do you mean by TGA? Explain application of it.	**04**
	(c)	What are titrations? Explain EDTA titration in detail with procedure and calculation.	**07**

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