Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2133502 Date:04/01/2017

Subject Name:Analytical Techniques

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Define the term: mass spectroscopy	
	2	Define the term: auxochrome	
	3	What is reverse phase chromatography?	
	4	Which indicator is used in redox titration?	
	5	What is Gradient Elution?	
	6	Full form of TGA.	
	7	Define the term : Red shift	
	8	Which solvents are mostly used in UV spectroscopy?	
	9	What is determinate error?	
	10	Which internal reference is used in NMR spectroscopy?	
	11	Define the term: Volumetric Estimation.	
	12	Name the various types of stretching vibrations.	
	13	What is the range of IR radiations?	
	14	Define the term: Base peak.	
Q.2	**(a)**	Write a note on detector used in GC.	**03**
	(b)	What are absorption laws? How is an ultraviolet spectrum plotted?	**04**
	(c)	Discuss theory and instrumentation of HPLC.	**07**
		OR	
	(c)	Describe in detail the instrumentation for scanning the mass spectrum of an organic compound.	**07**
Q.3	**(a)**	Enlist method of preparation of TLC plates.	**03**
	(b)	Write a short note on chemical shift.	**04**
	(c)	What is good laboratory practices? Explain in detail.	**07**
		OR	
Q.3	**(a)**	Explain reciprocating pump used in HPLC.	**03**
	(b)	Define various ways of expression of concentration and its importance in analytical techniques.	**04**
	(c)	Enlist various applications of IR spectroscopy.	**07**
Q.4	**(a)**	Enlist different types of errors.	**03**
	(b)	Explain EDTA titration with procedure and calculation.	**04**
	(c)	Analysis of sample gave following values of Al content: 30.12, 30.15, 30.10, 30.13, 30.11 and 30.14.Calculate the mean, median, standard deviation, coefficient of variance and range.	**07**
		OR	
Q.4	**(a)**	How will you distinguish cis 1,2- dichloro ethane and trans 1,2-dichloro ethane by IR spectrum?	**03**
	(b)	Define the term: post precipitation	**04**
	(c)	Write classification of chromatography and elaborate it with Paper chromatography.	**07**
Q.5	**(a)**	Explain importance of temperature programing in GC.	**03**

	(b)	Write a short note on Nitrogen rule.	**04**
	(c)	An organic compound (molecular formula :$C_9H_{10}O_2$) exhibits the following spectral data: IR: 1745 cm^{-1} (s), 1225 cm^{-1} (br, s), 749 cm^{-1} (s); 697 cm^{-1} (s) UV: λ_{max} at 268 nm, 264 nm, 262 nm, 257 nm NMR: 1.96 δ (3H, singlet), 5.00 δ (2H,singlet), 7.22 δ (5H,singlet) Deduce the structure of the compound.	**07**

OR

Q.5	**(a)**	Write a short note on guard column.	**03**
	(b)	Define the term: TQM	**04**
	(c)	Define the term: co-precipitation. Explain Gravimetric estimation of Ni.	**07**

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