Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) EXAMINATION – SUMMER 2016

Subject Code:2133502 **Date:31/05/2016**

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	What is TQM?	
	2	Define the term: Chromophore.	
	3	What is normal phase chromatography?	
	4	Which indicator is used in EDTA titration?	
	5	What is Isocratic Elution?	
	6	Give selection rule for IR.	
	7	Define the term : Hypochromic shift	
	8	Which solvents are mostly used in UV spectroscopy?	
	9	What is indeterminate error?	
	10	Which internal reference is used in NMR spectroscopy?	
	11	Define the term: Volumetric Estimation.	
	12	Name the various types of bending vibrations.	
	13	Define the term: Spectroscopy	
	14	Full form of GLP.	
Q.2	**(a)**	Explain reciprocating pump used in HPLC.	**03**
	(b)	Discuss theory and instrumentation of Gas chromatography.	**04**
	(c)	Derive Lambert-beer's laws of absorption with limitations.	**07**
		OR	
	(c)	Write in detail the general fragmentation modes in mass spectroscopy.	**07**
Q.3	**(a)**	Explain various factors affecting Rf value in paper Chromatography.	**03**
	(b)	Write a short note on molecular ion or the parent ion.	**04**
	(c)	Define the term: co-precipitation. Explain Gravimetric estimation of Fe.	**07**
		OR	
Q.3	**(a)**	Write a note on FID used in GC.	**03**
	(b)	Enlist different types of paper chromatography techniques.	**04**
	(c)	Write a short note on Finger print region. How will you distinguish cis 1,2- dibromo ethane and trans 1,2-dibromo ethane by IR spectrum?	**07**
Q.4	**(a)**	Enlist different methods for the preparation of Column.	**03**
	(b)	Explain EDTA titration with procedure and calculation.	**04**
	(c)	Analysis of sample gave following values of Cu content: 40.12, 40.16, 40.10, 40.13, 40.11 and 40.14.Calculate the mean, median, standard deviation, coefficient of variance and range.	**07**
		OR	
Q.4	**(a)**	Explain the term 'spin-spin coupling' in NMR spectroscopy.	**03**

	(b)	Enlist different types of errors.	**04**
	(c)	Explain different types of transitions involved in UV-Visible spectroscopy with examples.	**07**
Q.5	**(a)**	Explain importance of Derivertization in GC.	**03**
	(b)	Write a short note on Metal ion indicators.	**04**
	(c)	An organic compound (molecular formula :$C_5H_8O_3$) exhibits the following spectral data: IR: 3000 - 2500 cm^{-1} (b), 1715 cm^{-1} (s), 1342 cm^{-1} (w) UV: λ_{max} at 283 nm NMR: 7.88 τ (3H, singlet), 7.40 τ (2H,triplet), 7.75 τ (2H,triplet), -1.1 τ (1H, singlet) Deduce the structure of the compound.	**07**

OR

Q.5	**(a)**	Write a short note on guard column used in HPLC.	**03**
	(b)	Define the term: post precipitation	**04**
	(c)	What is good laboratory practices? Explain in detail.	**07**

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