Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2163610 **Date: 01/05/2017**

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 : Red shift	
	2	Which internal reference is used in NMR spectroscopy?	
	3	What is the range of IR radiations?	
	4	Define the term: Base peak.	
	5	Which indicator is used in redox titration?	
	6	Define the term: Isocratic elution	
	7	What is determinate error?	
	8	Define the term: Hook's law	
	9	What do you mean by volumetric estimation?	
	10	Name the various types of stretching vibrations.	
	11	Define the term: Derivertisation in GC	
	12	What is reverse phase chromatography?	
	13	Full form of TGA.	
	14	Define the term: chromophore	
Q.2	**(a)**	Write a short note on Nitrogen rule.	**03**
	(b)	Explain EDTA titration with procedure and calculation.	**04**
	(c)	What is Chromatography? Explain theory and instrumentation of Gas chromatography.	**07**
		OR	
	(c)	Define various ways of expression of concentration and its importance in analytical techniques.	**07**
Q.3	**(a)**	How will you distinguish cis 1,2- dichloro ethane and trans 1,2-dichloro ethane by IR spectrum?	**03**
	(b)	Explain various transitions involved in UV-visible spectroscopy.	**04**
	(c)	Write a short note on reciprocating pump and role of guard column used in HPLC.	**07**
		OR	
Q.3	**(a)**	Write a short note on validation of analytical methods.	**03**
	(b)	Describe in detail the instrumentation for scanning the mass spectrum of an organic compound.	**04**
	(c)	What is good laboratory practices? Explain in detail.	**07**
Q.4	**(a)**	Write a note on detector used in GC.	**03**
	(b)	Explain shielding and deshielding effect.	**04**
	(c)	Define the term: Gravimetric Estimation. Explain Gravimetric estimation of Ni.	**07**

OR

Q.4	**(a)**	Write a short note on TLC.	**03**
	(b)	How the samples are prepared for IR, UV, NMR and Mass Spectroscopy?	**04**
	(c)	Analysis of sample gave following values of Cu content: 5.12, 5.15, 5.10, 5.13, 5.11 and 5.14.Calculate the mean, median, standard deviation, coefficient of variance and range.	**07**
Q.5	**(a)**	Discuss different types of errors.	**03**
	(b)	Enlist applications of IR spectroscopy.	**04**
	(c)	What are absorption laws? How is an ultraviolet spectrum plotted?	**07**

OR

Q.5	**(a)**	What is Total Quality Management, write a short note on it.	**03**
	(b)	Define the term: co-precipitation & post precipitation	**04**
	(c)	An organic compound (molecular formula :$C_5H_8O_3$) exhibits the following spectral data: UV: 283 nm IR: 3000-2500 cm^{-1} (b), 1715 cm^{-1} (s), 1342 cm^{-1} (w) NMR: 7.88 τ (3H, singlet), 7.40 τ (2H, triplet), 7.75 τ (2H, triplet) and -1.1 τ singlet (1H) Deduce the structure of the compound.	**07**

****