Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER • 2014

Subject Code: 133502 **Date: 26-05-2014**

Subject Name: Analytical Techniques

Time: 02.30 pm - 05.30 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What is chromatography? Draw instrumentation diagram and explain the principle and applications of Gas Chromatography.	**07**
	(b)	Explain following terms: Spectroscopy, Blue shift, Hypsochromic shift, Hook's law, Sheilding, Nitrogen rule, Chromophores.	**07**
Q.2	**(a)**	Explain Lambert's Beer law and also discuss UV Spectroscopy.	**07**
	(b)	Write in detail about Good Laboratory Practices.	**07**
		OR	
	(b)	Write in detail about how validation of analytical method is done?	**07**
Q.3	**(a)**	What is titration? Explain complexometric titrations in details with suitable example.	**07**
	(b)	Write short notes on: Column chromatography, Retention Factor	**07**
		OR	
Q.3	**(a)**	What is thin layer chromatography; write in detail about this technique & its applications?	**07**
	(b)	Explain how sampling of solids is done.	**07**
Q.4	**(a)**	What is Thermogravimetric analysis, explain in details.	**07**
	(b)	Write short notes on: Qualitative analysis, Gravimetric analysis of Ni.	**07**
		OR	
Q.4	**(a)**	Explain instrumentation and application of IR spectroscopy. Also explain the difference between formaldehyde and formic acid on the basis of IR spectroscopy.	**07**
	(b)	Write short notes on: Mclafferty rearrangement, Coupling constant	**07**
Q.5	**(a)**	Analysis of alloy sample gave following values of metal content: 7.15, 7.01, 7.10, 7.09, 7.10, and 7.21. Calculate the mean, median, standard deviation, coefficient of variance, range & standard error.	**07**
	(b)	Write short notes on: Errors, Metal ion indicators, Quality control	**07**
		OR	
Q.5	**(a)**	Deduce the tentative structure of organic compound by using following data: i) UV= 280 nm ii) IR=3000-2500 cm^{-1}, 1715 cm^{-1}, 1342 cm^{-1} iii) Molecular mass =116 iv) NMR (δ)= 2.12 (s, 3H), 2.50 (t, 2H), 2.25 (t, 2H), 10.11 (s,1H)	**07**
	(b)	Explain in detail about precipitation, co precipitation and post precipitation.	**07**

****