Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER 2013

Subject Code: 133502 **Date: 28-11-2013**

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 Beer Lambert's law? Also discuss instrumentation, applications of UV spectroscopy.	**07**
	(b)	Explain the following: red shift, retention time, standard error, co-precipitation, auxochrome, pH and titration.	**07**
Q.2	**(a)**	What is chromatography? Elaborate with the help of paper chromatography.	**07**
	(b)	Write the importance of GLP.	**07**
		OR	
	(b)	What is Quality? Write short notes on: Quality control & Total quality management.	**07**
Q.3	**(a)**	What is brass and how analysis of brass is done? Explain in detail.	**02+05**
	(b)	What is the principle of reverse phase chromatography? Draw clean diagram of HPLC and explain it's applications.	**02+03+02**
		OR	
Q.3	**(a)**	Define errors and their classification. Also explain how validation of analytical method is done.	**01+02+04**
	(b)	Define stoichiometry and also explain following terms: normality, molarity, molality, strength, percentage purity.	**02+05**
Q.4	**(a)**	Explain acid-base titrations in details.	**07**
	(b)	What is the difference between qualitative and quantitative analysis? Explain gravimetric analysis of Fe.	**03+04**
		OR	
Q.4	**(a)**	Explain principle, instrumentation and working of Mass spectroscopy.	**02+03+02**
	(b)	What is retention factor? Explain role of R_f in various chromatographic techniques and factors affecting it.	**02+02+03**
Q.5	**(a)**	Analysis of brass sample gave following values of metal content: 6.05, 6.11, 6.10, 6.09, 6.10, and 6.21. Calculate the mean, median, standard deviation, coefficient of variance, range & standard error.	**07**
	(b)	Explain shielding, de-shielding and coupling constant in NMR and also explain the difference between *o*- & *p*-hydroxyl benzoic acid with possible spectroscopic techniques	**03+04**
		OR	
Q.5	**(a)**	Deduce the tentative structure of organic compound by using following data: i) UV=transparent above 220 nm ii) IR=2927 cm^{-1}, 1745 cm^{-1}, 1458 cm^{-1} iii) Molecular mass =116 iv) NMR (δ)= 2.01 (s, 3H), 1.50 (s, 9H)	**07**
	(b)	Explain precipitation from homogeneous solution (steps involved) and give details of thermo gravimetric analysis.	**03+04**

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