Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION –SUMMER 2015

Subject Code: 2133502 **Date: 29/05/2015**

Subject Name: Analytical Techniques

Time: 02.30pm-05.00pm **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)**	Define the term: Chromatography. Explain theory and instrumentation of Gas chromatography.	**07**
	(b)	What are titrations? Explain EDTA titration in detail with procedure and calculation.	**07**
Q.2	**(a)**	i. Write a note on most widely used solid stationary phase in GC.	**04**
		ii. Write a short note on sampling loop used in chromatography.	**03**
	(b)	Explain principle, instrumentation and working of IR spectroscopy.	**07**
		OR	
	(b)	What is good laboratory practises (GLP)? Explain in detail.	**07**
Q.3	**(a)**	Explain volumetric estimation of brass alloy with procedure and calculation.	**07**
	(b)	What are the characteristics should pumps have used in HPLC. Discuss any one in detail with diagram.	**07**
		OR	
Q.3	**(a)**	Write a note on column Chromatography.	**07**
	(b)	Describe in detail the instrumentation for scanning the mass spectrum of an organic compound.	**07**
Q.4	**(a)**	i. What is Rf value? Explain various factors affecting in TLC.	**04**
		ii. Write a short note on guard column used in HPLC.	**03**
	(b)	Analysis of sample gave following values of Cu content: 41.20, 41.33, 41.60, 41.37 and 41.27.Calculate the mean, median, standard deviation, coefficient of variance and range.	**07**
		OR	
Q.4	**(a)**	Define the term: co-precipitation and post precipitation. Explain Gravimetric estimation of Ni.	**07**
	(b)	Write notes on Chemical shift, shielding, deshielding effect and spin-spin coupling.	**07**
Q.5	**(a)**	Explain different types of transitions involved in UV-Visible spectroscopy with examples.	**07**
	(b)	Write a short note on Finger print region. How will you distinguish Ethanol and dimethyl ether using IR spectrum?	**07**
		OR	
Q.5	**(a)**	Explain Lambert Beer's law of absorption with derivation.	**07**

(b) An organic compound (molecular formula :C_8H_8O) exhibits the following spectral data: **07**

IR: 3042 cm^{-1}(m), 2862 cm^{-1}(w), 2740 cm^{-1}(w), 1722 cm^{-1}(s),1605 cm^{-1} and 1575 cm^{-1}

UV: λ_{max} at 292 nm

NMR: δ 7.28 (5H, multiplet), 2.8 (2H,doublet), 9.78 (1H,triplet)

Deduce the structure of the compound.

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