Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – WINTER 2015

Subject Code:133502 Date:21/12/2015

Subject Name: Analytical Techniques

Time: 2:30pm to 5:00pm 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	**07**

variance and range.

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.