

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 2133502****Date: 30/11/2019****Subject Name: Analytical Techniques****Time: 02:30 PM TO 05:00 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	(a) Explain terms QA & QC.	03
	(b) Explain various factors affecting Rf value in paper Chromatography	04
	(c) Discuss theory and instrumentation of HPLC.	07
Q.2	(a) Enlist different types of errors.	03
	(b) Define the term: TQM	04
	(c) Explain Lambert Beer's law of absorption with derivation.	07
OR		
	(c) Write notes on Chemical shift, shielding, deshielding effect and spin-spin coupling.	07
Q.3	(a) Write a short note on column preparation.	03
	(b) Write a note on FID used in GC.	04
	(c) Define the term: co-precipitation and post precipitation. Explain Gravimetric estimation of Ni.	07
OR		
Q.3	(a) Define the term: Stoichiometry	03
	(b) Write a short note: Nitrogen rule.	04
	(c) Write a short note on Finger print region. How will you distinguish Ethanol and dimethyl ether using IR spectrum?	07
Q.4	(a) Enlist method of preparation of TLC plates.	03
	(b) Define various ways of expression of concentration and its importance in analytical techniques	04
	(c) An organic compound (molecular formula: C ₆ H ₁₂ O ₂) exhibits the following spectral data: IR: 3330 cm ⁻¹ (m), 3042 cm ⁻¹ (m), 2862 cm ⁻¹ (w), 1722 cm ⁻¹ (s), 1405 cm ⁻¹ UV: λ _{max} at 268 nm NMR: δ 1.1 (6H, singlet), 2.1 (3H,singlet), 2.6 (2H,singlet), 3.9 (1H, singlet) Deduce the structure of the compound.	07
OR		
Q.4	(a) How will you distinguish inter and intra-molecular hydrogen bonding using IR spectroscopy?	03
	(b) Explain Spectroscopic behavior of p-hydroxy benzoic acid.	04
	(c) 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
Q.5	(a) Write the characteristic requisites for a solvent to act as mobile phase.	03
	(b) Derivatization is needed in GC - Justify the statement	04
	(c) What are good laboratory practices? Explain in detail.	07
OR		
Q.5	(a) Define the term: Derivatization	03
	(b) What do you mean by TGA? Explain application of it.	04
	(c) What are titrations? Explain EDTA titration in detail with procedure and calculation.	07
