

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (New) EXAMINATION – WINTER 2018

Subject Code: 2133502**Date: 01/12/2018****Subject Name: Analytical Techniques****Time: 10:30 AM TO 01:00 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) Write principle of chromatography.	03
(b) Explain terms QA & QC.	04
(c) Explain following Terms: isocratic elution, standard deviation, constant error, Beer's law, solvents for NMR, TQM, normal phase chromatography	07
Q.2 (a) What will happen if you add HCl to aniline (spectroscopically)?	03
(b) Explain any pump used in HPLC.	04
(c) What is good laboratory practices? Explain in detail.	07
OR	
(c) Define various ways of expression of concentration and its importance in analytical techniques.	07
Q.3 (a) Enlist different types of errors.	03
(b) How samples are prepared in UV, IR and NMR spectroscopy?	04
(c) Suggest chromatography by which you may separate a mixture of volatile liquids. Draw its instrumentation diagram with working of it.	07
OR	
Q.3 (a) Explain the term 'spin-spin coupling' in NMR spectroscopy.	03
(b) Derivatization is needed in GC - Justify the statement.	04
(c) Do you feel Total Quality Management is necessary for industries, give reasons for your answer?	07
Q.4 (a) Write a short note on guard column used in HPLC.	03
(b) A sample of hard water is to be tested in the chemistry laboratory, which type of titration do you think will be useful for its analysis? Write the details of the method with chemical reactions.	04
(c) Draw labeled diagram of instrumentation of UV-VIS spectroscopy. State its principle and applications.	07
OR	
Q.4 (a) Write a short note on different columns used in chromatography.	03
(b) Explain Spectroscopic behavior of p-hydroxy benzoic acid.	04
(c) Write a short note on: Hook's law, and degree of freedom.	07
Q.5 (a) Write notes on: Retention Time, Retention Factor	03
(b) Explain any redox titration with procedure and calculation.	04
(c) Define the term: post precipitation. Explain Gravimetric estimation of Cu.	07
OR	
Q.5 (a) Write the characteristic requisites for a solvent to act as mobile phase.	03

- (b) What do you mean by TGA? Explain application of it. **04**
- (c) Propose tentative structure of organic compound, on the basis of following data: (Also explain spectroscopic data given below) **07**
- i) UV= 270 nm
 - ii) IR=2941-2857 cm⁻¹ (m), 1715 cm⁻¹ (s), 1460 cm⁻¹ (m)
 - iii) NMR= quartet at 2.48 δ (12 squares), singlet at 2.12 δ (17.6 squares), triplet at 1.08 (18.2 squares)
 - iv) Molecular mass =72
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