

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2133502****Date: 07/06/2019****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) Write principle of chromatography.	03
(b) Explain terms QA & QC.	04
(c) Explain following Terms: isocratic elution, standard deviation, relative error, Beer's law, solvents for NMR, TQM, normal phase chromatography	07
OR	
Q.2 (a) Explain spectroscopic behavior of p-Nitro phenol.	03
(b) Explain reciprocating 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) Write a short note on Finger print region.	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 terms: Chemical shift, shielding and deshielding effect	03
(b) Temperature programming is needed in GC - Justify the statement.	04
(c) Do you feel TQM is necessary for industries, give reasons for your answer?	07
Q.4 (a) Write a short note on sampling loop 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 Mass spectrometer. State its principle and applications.	07
OR	
Q.4 (a) Write a short note on different columns used in chromatography.	03
(b) Explain different transitions involved in UV-Visible spectroscopy.	04
(c) Enlist various applications of IR spectroscopy.	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 Fe.	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**
- IR: 2941 cm^{-1} (b), 1755 cm^{-1} (s), 1460 cm^{-1} (w)
- UV: 274 nm
- Molecular mass: 72
- NMR: 2.48 (quartet), 2.22 (singlet), 1.17 (triplet)
