

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019****Subject Code:2163610****Date:14/05/2019****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
<b>Q.1</b>	(a) Discuss different types of errors.	<b>03</b>
	(b) Define the following terms: Spectroscopy, Absolute error, Chromophore, TQA	<b>04</b>
	(c) What are absorption laws? How is an UV spectrum plotted?	<b>07</b>
<b>Q.2</b>	(a) Write a note on FID used in GC.	<b>03</b>
	(b) A sample of steel alloy 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.	<b>04</b>
	(c) Define various ways of expression of concentration and its importance in analytical techniques.	<b>07</b>
<b>OR</b>		
	(c) Suggest chromatography by which you may separate a mixture of volatile liquids. Draw its instrumentation diagram with working of it.	<b>07</b>
<b>Q.3</b>	(a) Write a short note on temperature programming used in GC.	<b>03</b>
	(b) Explain: How will you differentiate between inter and intra molecular H-bonding compounds with the help of IR and NMR Spectroscopy.	<b>04</b>
	(c) What are good laboratory practices? Explain in detail.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Explain role of guard column used in HPLC.	<b>03</b>
	(b) Explain the spectroscopic behavior of p-Nitro Phenol.	<b>04</b>
	(c) Give selection rule for IR spectroscopy. Convert wavelength of 5.0 $\mu$ into wavenumber. Also explain its instrumentation.	<b>07</b>
<b>Q.4</b>	(a) What is Total Quality Management, write a short note on it.	<b>03</b>
	(b) Explain EDTA titration with procedure and calculation.	<b>04</b>
	(c) An organic compound exhibits the following spectral data: IR: 3077 $\text{cm}^{-1}$ (b), 2976 $\text{cm}^{-1}$ (s), 1745 $\text{cm}^{-1}$ (s), 1456 $\text{cm}^{-1}$ (w) UV: 220 nm Molecular mass: 164 NMR: 2.7 $\tau$ (singlet) 16.5 squares, 5.70 $\tau$ (triplet) 6.2 squares, 7.07 (triplet) 6.7 squares and 7.98 $\tau$ (singlet) 10.2 squares Deduce the structure of the compound.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Write a short note on post precipitation.	<b>03</b>
	(b) Write a short note on reciprocating pump used in HPLC.	<b>04</b>
	(c) Draw labeled diagram of instrumentation of UV-VIS spectroscopy. State its working with principle.	<b>07</b>
<b>Q.5</b>	(a) Write a short note on Nitrogen rule.	<b>03</b>
	(b) Define the terms: shielding and deshielding effect.	<b>04</b>
	(c) Define the term: Gravimetric Estimation. Explain Gravimetric estimation of Ni.	<b>07</b>

**OR**

- Q.5** (a) Enlist different types of vibrations in IR spectroscopy. **03**  
(b) Write a short note on McLafferty rearrangement. **04**  
(c) Explain TGA with applications. **07**

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