

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – SUMMER • 2014****Subject Code: 133502****Date: 26-05-2014****Subject Name: Analytical Techniques****Time: 02.30 pm - 05.30 pm****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) What is chromatography? Draw instrumentation diagram and explain the principle and applications of Gas Chromatography. **07**
(b) Explain following terms: Spectroscopy, Blue shift, Hypsochromic shift, Hook's law, Sheilding, Nitrogen rule, Chromophores. **07**
- Q.2** (a) Explain Lambert's Beer law and also discuss UV Spectroscopy. **07**
(b) Write in detail about Good Laboratory Practices. **07**
- OR**
- (b) Write in detail about how validation of analytical method is done? **07**
- Q.3** (a) What is titration? Explain complexometric titrations in details with suitable example. **07**
(b) Write short notes on: Column chromatography, Retention Factor **07**
- OR**
- Q.3** (a) What is thin layer chromatography; write in detail about this technique & its applications? **07**
(b) Explain how sampling of solids is done. **07**
- Q.4** (a) What is Thermogravimetric analysis, explain in details. **07**
(b) Write short notes on: Qualitative analysis, Gravimetric analysis of Ni. **07**
- OR**
- Q.4** (a) Explain instrumentation and application of IR spectroscopy. Also explain the difference between formaldehyde and formic acid on the basis of IR spectroscopy. **07**
(b) Write short notes on: Mclafferty rearrangement, Coupling constant **07**
- Q.5** (a) Analysis of alloy sample gave following values of metal content: 7.15, 7.01, 7.10, 7.09, 7.10, and 7.21. Calculate the mean, median, standard deviation, coefficient of variance, range & standard error. **07**
(b) Write short notes on: Errors, Metal ion indicators, Quality control **07**
- OR**
- Q.5** (a) Deduce the tentative structure of organic compound by using following data: **07**
i) UV= 280 nm
ii) IR=3000-2500 cm^{-1} , 1715 cm^{-1} , 1342 cm^{-1}
iii) Molecular mass =116
iv) NMR (δ)= 2.12 (s, 3H), 2.50 (t, 2H), 2.25 (t, 2H), 10.11 (s,1H)
(b) Explain in detail about precipitation, co precipitation and post precipitation. **07**
