

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 133502****Date: 28-11-2013****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 Beer Lambert's law? Also discuss instrumentation, applications of UV spectroscopy. **07**
 (b) Explain the following: red shift, retention time, standard error, co-precipitation, auxochrome, pH and titration. **07**
- Q.2** (a) What is chromatography? Elaborate with the help of paper chromatography. **07**
 (b) Write the importance of GLP. **07**
- OR**
- (b) What is Quality? Write short notes on: Quality control & Total quality management. **07**
- Q.3** (a) What is brass and how analysis of brass is done? Explain in detail. **02+05**
 (b) What is the principle of reverse phase chromatography? Draw clean diagram of HPLC and explain its applications. **02+03+02**
- OR**
- Q.3** (a) Define errors and their classification. Also explain how validation of analytical method is done. **01+02+04**
 (b) Define stoichiometry and also explain following terms: normality, molarity, molality, strength, percentage purity. **02+05**
- Q.4** (a) Explain acid-base titrations in details. **07**
 (b) What is the difference between qualitative and quantitative analysis? Explain gravimetric analysis of Fe. **03+04**
- OR**
- Q.4** (a) Explain principle, instrumentation and working of Mass spectroscopy. **02+03+02**
 (b) What is retention factor? Explain role of R_f in various chromatographic techniques and factors affecting it. **02+02+03**
- Q.5** (a) Analysis of brass sample gave following values of metal content: 6.05, 6.11, 6.10, 6.09, 6.10, and 6.21. Calculate the mean, median, standard deviation, coefficient of variance, range & standard error. **07**
 (b) Explain shielding, de-shielding and coupling constant in NMR and also explain the difference between *o*- & *p*-hydroxyl benzoic acid with possible spectroscopic techniques **03+04**
- OR**
- Q.5** (a) Deduce the tentative structure of organic compound by using following data: **07**
 i) UV=transparent above 220 nm
 ii) IR=2927 cm^{-1} , 1745 cm^{-1} , 1458 cm^{-1}
 iii) Molecular mass =116
 iv) NMR (δ)= 2.01 (s, 3H), 1.50 (s, 9H)
 (b) Explain precipitation from homogeneous solution (steps involved) and give details of thermo gravimetric analysis. **03+04**
