

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. Pharmacy Sem-I Regular / Remedial Examination January/February 2011

Subject code: 910001

Subject Name: Modern analytical Techniques

Date: 29 /01 /2011

Time: 10.30 am – 01.30 pm

Instructions:

Total Marks: 80

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss the principle of HPLC. What are the advantages of HPLC. **06**
(b) Explain Why **10**
(i) Amines absorb at higher wavelength in comparison to alcohols in UV spectroscopy.
(ii) CD curves are obtained in those optical isomers only which have chromophoric groups.
(iii) M is not obtained for sugars using EI source but it can be obtained in FAB.
(iv) The number of peaks obtained in IR are always less than $3N-6$.
(v) Reverse phase chromatography is more commonly used in analysis of drugs and pharmaceuticals.
- Q.2** (a) Explain and give examples of the types of transition occur in organic compounds. **06**
(b) A solution containing 3.00 ppm has a transmittance of 65% in 1.00 cm cell. **04**
Calculate
(i) Absorbance of the solution.
(ii) Calculate transmittance and absorbance of a solution containing 5.2 ppm of the solute.
(iii) What is molar absorptivity if molecular weight is 155.
(c) Explain the principle of RIA and IRMA. Give differences between ELISA and EMIT. **06**
- Q.3** (a) Discuss the role of Michelson interferometer in FT-IR. **05**
(b) Discuss various factors which influence the position of the absorption frequencies from the normal value in IR spectroscopy. **05**
(c) How will you differentiate between the following pairs of compounds using IR spectroscopy **06**
(i) $\text{CH}_3\text{CH}_2\text{CHO}$ and $\text{CH}_2=\text{CHCH}_2\text{OH}$
(ii) $\text{CH}_3\text{CH}_2\text{OH}$ and CH_3CHO
(iii) CH_3COOH and CH_3COCH_3
- Q.4** (a) Write the principle of NMR spectroscopy. **06**
(b) Discuss hydrogen decoupling and off resonance decoupling in CMR spectroscopy. **04**
(c) How will you analyze the following compounds on the basis of NMR spectroscopy **06**
(i) $\text{CH}_3\text{CH}_2\text{Br}$
(ii) $\text{CH}_3\text{CHClCH}_3$
(iii) $\text{CH}_3\text{OCH}_2\text{CH}_3$
(iv) CH_3CHO

- Q.5** (a) Enumerate various types of Mass analyzer. Discuss quadrupole mass analyzer with appropriate diagram. **05**
- (b) Give the fragmentation pattern of the following compounds **06**
- (i) Benzyl alcohol
 - (ii) Phenol
 - (iii) Ethyl sec. butyl ether
 - (iv) Acetophenone
- (c) Write short notes on **05**
- (i) Mc Lafferty rearrangement
 - (ii) MALDI-MS
- Q.6** (a) Discuss the principle and important applications of Atomic absorption spectroscopy. **06**
- (b) Define Bragg's equation for diffraction of x-rays by crystals. How it can be used. **05**
- (c) What do you understand by **05**
- (i) Zone electrophoresis
 - (ii) Moving boundary electrophoresis
- Q.7** Define the following terms **04**
- (a) (i) Capacity factor (ii) Resolution
(iii) Selectivity (iv) Plate Number
- (b) Define and describe TGA. Discuss the thermogravimetric curve of Calcium oxalate monohydrate **06**
- Write short notes on **06**
- (c) (i) ORD and cotton effect
(ii) Size exclusion chromatography
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