

PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
M.Sc. Winter 2017-18 Examination

Semester: 1
Subject Code: 11205104
Subject Name: Analytical Chemistry-I

Date: 26/12/2017
Time: 02:00 pm to 04:30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1. A) Brief note (Each of 04 marks) (08)**
- (a) Write the mechanism of separation in size exclusion chromatography.
 - (b) Discuss the concept of Supercritical Fluid Chromatography.
- Q.1. B) Answer the following questions (Any two) (04)**
- (a) Short note (04)
 1. Draw a labeled diagram of TGA instrument.
 2. Name the types of detectors used in GC.
 - (b) Write a brief note on Principle, instrumentation and application of Amperometric titration. (04)
 - (c) Write a detailed note on types of electrodes. Describe enzyme substrate electrode for NH₃. (04)
- Q.2. A) Answer the following questions. (04)**
- (a) Fill in the blanks. (04)
 1. LEED stands for _____.
 2. GCMS stands for _____.
 - (b) Define resolution, retention time and relative retention time. (04)
- Q.2. B) Answer the following questions (Any two) (03)**
- (a) Multiple choice questions. (03)
 1. The neutron diffraction patterns can distinguish experimentally between
 - (a) Paramagnetic structures (b) Ferromagnetic structures (c) Diamagnetic structures (d) all
 2. In gas solid chromatography, the fixed phase consists of a solid material such as-
 - (a) Alumina (b) CS₂ (c) Granular silica (d) ALL
 3. The mobile phase in GLC is usually
 - (a) He (b) N₂ (c) CO₂ (d) None
 - (b) List out the factors which affect differential thermal analysis. (03)
 - (c) Write a brief note on LEED. (03)
- Q.3. A) Brief note (Each of 04 marks) (08)**
- (a) Derive Bragg's equation and describe the limitations of
 - (1) Laue method (2) Bragg's method for X-ray structural analysis.
- Q.3. B) Answer the following questions (Any two) (04)**
- (a) Short note (04)
 1. Draw a neat and clean diagram of HPLC instrument.
 2. Write the names of indicators and solvents used for non-aqueous titration.
 - (b) Describe the types of DSC with diagram. (04)
 - (c) Discuss the factors which affect Differential Scanning Calorimetry. (04)
- Q.4. A) Answer the following questions. (04)**
- (a) Fill in the blanks. (04)
 1. Lower viscosity of the solvent usually give _____ chromatographic efficiency.
 2. _____ is used in GC for temperature control and regulation.
 - (b) Discuss the applications of thermometric titrations. (04)
- Q.4. B) Answer the following questions (Any two) (03)**
- (a) Multiple choice questions. (03)
 1. UV detectors are not very successful in case of -
 - (a) Lipids (b) Sugars (c) Bile acids (d) ALL
 2. Methanol/water mixture is a -
 - (a) Polar eluent (b) Non polar eluent (c) Both (d) None
 3. In DTA the sample container and reference container is usually made up of-
 - (a) Alumina (b) Borosilicate glass (c) Fused Quartz (d) Brass
 - (b) Write the applications of adsorption chromatography. (03)
 - (c) Write a brief note on applications of GC. (03)