

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Fourth Semester)

Branch- CHEMISTRY

ANALYTICAL CHEMISTRY

Time : Three Hours

Maximum : 75 Marks

Answer ALL questions
ALL questions carry EQUAL marks (5 x 15 = 75)

- 1 a What is meant by size exclusion chromatography? Why is it called so? (3)
- b Discuss the applications of ion-exchangers: (5)
- c Discuss the principle and applications of paper electrophoresis. (7)
- OR
- d What are cation exchangers? Give example. (3)
- e Compare GSC with GIC. (5)
- f Discuss the principle and instrumentation of HPLC. (7)
- 2 a State nitrogen rule. (3)
- b Discuss the McLafferty rearrangement with an example. (5)
- c What are isotopic clusters? Illustrate the use of isotopic clusters in the elucidation of structure of organic compounds. (7)
- OR
- d Illustrate ortho effect with an example. (3)
- e Discuss the characteristic mass spectral fragmentation of aldehydes, ketones and esthers. (5)
- f An organic compound ($C_{10}H_{12}O$) has peaks at m/z 15, 43, 57, 91, 105 and 148. Deduce the structure of the compound. (7)
- 3 a List the differences between atomic absorption and flame emission. (3)
- b i) Why is the technique of atomic absorption limited to only metals? (5)
- ii) In atomic absorption, the elements such¹ as Al, Mo and V cannot be detected when a flame is used to produce the atomic state. Why? (7)
- c Discuss the factors responsible for the precision of atomic absorption measurement.
- OR
- d Mention the advantages of double beam absorption spectrometer. (3)
- e Discuss the various types of emission spectra. (5)

Cont...

- 3 Cont... (7)
- f Discuss the principle and instrumentation of atomic emission spectrometer. (7)
- 4 a What is TGA? (3)
- b What do you mean by differential thermal analysis? What useful result can you get by this technique? (5)
- c Discuss the factors affecting thermograms. List also the precautions to be followed for using thermobaiance. (7)
- OR
- d What is (i) dynamic TGA and (ii) isothermal TGA. (3)
- e Discuss the thermogravimetric analysis of calcium oxalate monohydrate. (5)
- f Draw the schematic diagram of thermobaiance. What are the characteristics of thermobaiance? (7)
- 5 a Explain the term half- wave potential. (3)
- b Discuss the factors affecting diffusion current. (5)
- c Write briefly on amperometric titration. (7)
- OR
- d What is the need for a three electrode system in cyclovoltammetry? (3)
- e Discuss any two applications of polarography. (5)
- f Discuss the principle and instrumentation of coulometric method. (7)

Z-Z-Z**END**