

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)

**MSc DEGREE EXAMINATION DECEMBER 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 Describe about ion exchange chromatography. (7)
- b Discuss the columns and adsorbents used in HPLC. (5)
- c Write short notes on paper electrophoresis. (3)

OR

- d Write the requirements of a gas chromatography detector and discuss briefly any two important detectors used in gas chromatography. (7)
- e Discuss the methods of packing columns in gas-liquid chromatography. (5)
- f What are the applications of HPLC? (3)
- 2 a Illustrate importance of molecular ion peak. (3)
- b Discuss the mass spectral fragmentation pattern for aldehydes. (5)
- c How are primary, secondary and tertiary alcohols differentiated by mass spectroscopy? Explain with suitable example. (7)

OR

- d Write notes on isotopic clusters. (3)
- e Give an account of spectral fragmentation of esters. (5)
- f The mass spectrum of ethyl sec - butyl ether shows a peak at  $m/e = 45$  and a many other peaks, the most prominent is at  $m/e = 73$ . How do you account for the following fragmentation?  
(i) Benzyl acetate (ii) 2 - ethyl phenol (iii) 1 - phenyl ethanol. (7)
- 3 a Discuss briefly about detection limits and sensitivity in AAS. (5)
- b How will you determine the metallic elements in food industry by atomic absorption spectroscopy? (5)
- c Explain the principle and types of Atomic Emission Spectroscopy. (5)

OR

- d Distinguish between atomic absorption and atomic emission spectroscopy. (3)
- e How will you determine the calcium, magnesium, sodium and potassium in blood serum? (5)
- f Explain the basic principle and instrumentation of flame emission spectroscopy. (7)

- 4 a Write the principle involved in Derivative Thermogravimetry (DTG). (3)
- b Explain the TGA behaviour of  $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$ . (5)
- c Discuss the DTA curve of  $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$  and give the applications of DTA. (7)
- OR
- d Sketch and explain the TGA curve of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ . (5)
- e What are the advantages of using a combination of thermogravimetric analysis (TGA) and differential thermal analysis (DTA)? (5)
- f Discuss the principle, instrumentation and any two applications of differential thermal analysis. (5)
- 5 a Write the indicator and reference electrode used in amperometric titration. (3)
- b Describe the principle and instrumentation of coulometric method. (8)
- c Write a note on half wave potential and its significance. (4)
- OR
- d What are the factors that affecting diffusion current? (5)
- e Discuss the principle and instrumentation of polarography. (5)
- f Write notes on the following : (5)
- (i) Kinetic current    (ii) Coulometric titration

**Z-Z-Z**

END