

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

- 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