

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024
(Fourth Semester)

Branch - CHEMISTRY

ADVANCED ANALYTICAL CHEMISTRY

Time: Three Hours

Maximum: 50 Marks

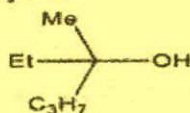
SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Which of the following is used as a spraying agent in paper chromatography?
(i) Conc.HCl (ii) NaCl solution
(iii) Ninhydrin solution (iv) CuSO₄ solution
- 2 In the mass spectrum of the compound given below, during the α -cleavage, the order of preferential loss of groups is



- (i) Me > C₃H₇ > Et (ii) C₃H₇ > Et > Me
(iii) Et > Me > C₃H₇ (iv) Et > C₃H₇ > Me
- 3 In atomic emission spectroscopy the emission due to the electronic transition of
(i) Singlet ground state to singlet excited state
(ii) Singlet excited state to singlet ground state
(iii) Singlet ground state to triplet excited state
(iv) Triplet excited state to singlet ground state
- 4 Which of the following option is appropriate for the TGA and DTA?
(i) TGA and DTA measures only weight
(ii) TGA measures only weight while DTA measures other effects
(iii) TGA and DTA measures only temperature
(iv) TGA measures only temperature while DTA measures other effects
- 5 In polarography, which is useful to study the nature of the substance?
(i) Residual current (ii) Diffusion current
(iii) Half wave potential (iv) Decomposition potential

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Illustrate a gas liquid chromatography along with systematic diagrammatic representation.
OR
b Analyze the ion exchange chromatography with principle methodology and its application.
- 7 a State and explain McLafferty rearrangement.
OR
b Assume a brief account on molecular ion peak and base peak of toluene and aniline.

Cont...

- 8 a Justify single and double beam spectrophotometer.
OR
b Bring out the difference between atomic and emission spectroscopy.
- 9 a Write differences between TGA and DTA.
OR
b Discuss the factors affecting the thermograms.
- 10 a Discuss in detail about the principle of coulometric method.
OR
b Illustrate the Amperometric titration.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Evaluate the basic principles of paper electrophoresis technique.
OR
b Analyze the principle and instrumentation of HPLC.
- 12 a Elucidate a Retro Diels-Alder rearrangement.
OR
b Anisole shows the following peaks in its mass spectrum m/e : 108, 93, 78, 77 and 65. Explain the above fragmentation pattern with the help of the structures.
- 13 a Elaborate the possible interferences in AAS and AES determination. How they corrected or prevented?
OR
b Evaluate a hollow cathode lamp and photomultiplier.
- 14 a Illustrate the basic principle of differential thermal analysis (DTA).
OR
b Analyze an instrumentation and applications of differential scanning calorimetry(DSC).
- 15 a Enumerate the principle and instrumentation of polarography.
OR
b Analyse principle involving cyclic voltammogram of one electron reversible process happened in potassium ferrocyanide/potassium ferricyanide.

Z-Z-Z END