



Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
(Autonomous)
End Semester Examination: MAR / APR 2025
Faculty: Science and Technology

Program: B.Sc
Program (Specific): B.Sc Chemistry
Class: T.Y.B.Sc
Name of the Course: Analytical Chemistry-II
Course Code: 24- CH-611(A)
Paper:

Semester: VI

SET: A
Course Type: SEC IV
Max.Marks: 35

Time: 2Hr

Instructions to the candidate:

- 1) *There are 4 sections in the question paper. Write each section on separate page.*
- 2) *All Sections are compulsory.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw a well labelled diagram wherever necessary.*

Q1) Choose the correct alternative

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a) For the separation of which of the following substances, Gas-solid chromatography is being used?

- | | |
|--|--|
| i) Thermally stable organic components | ii) Volatile organic components |
| iii) Thermally stable inorganic components | iv) Low molecular weight gaseous species |

b) Chromatography is a physical method that is used to separate and analyse _____

- | | | | |
|--------------------|----------------------|-----------------------|------------|
| i) Simple mixtures | ii) Complex mixtures | iii) Viscous mixtures | iv) Metals |
|--------------------|----------------------|-----------------------|------------|

c) Which of the following cannot be used as an adsorbent in Column adsorption chromatography?

- | | | | |
|--------------------|----------------|------------------------|----------------------------|
| i) Magnesium oxide | ii) Silica gel | iii) Activated alumina | iv) Potassium permanganate |
|--------------------|----------------|------------------------|----------------------------|

d) Which of the following steps takes place after injection of feed in Column chromatography?

- | | |
|------------------------------|------------------------------------|
| i) Detection of components | ii) Separation in the column |
| iii) Elution from the column | iv) Collection of eluted component |

e) Which of the following elements produce a characteristic flame emission spectrum?

- | | | | |
|-----------|--------------|-----------|---------------|
| i) Sodium | ii) platinum | iii) Iron | iv) Manganese |
|-----------|--------------|-----------|---------------|

Q2) Answer the following (Attempt any 4/6)

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- a) Peak height
- b) Isochratic elution
- c) Distribution ratio
- d) Stationary phase
- e) Retention time
- f) Detection limit



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Q3) Answer the following (Attempt any 4/6)

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- a) Methanol and ethanol are separated in a capillary GC column with retention time of 370 s and 385 s and Half widths are $W_{1/2}$ of 9.42 and 10.0 s resp. An unretained peak occurs at 10.0s. Calculate the resolution.
- b) What is the function of flame in AAS.
- c) What are the advantages of flame photometry?
- d) What is the role of monochromator in AAS ?
- e) What is efficiency of extraction?
- f) What is adsorption chromatography?

Q4) Answer the following (Attempt any 4/6)

8

- a) What are important features of AAS.
- b) What is height equivalent theoretical plate?
- c) State and explain principle of flame photometer.
- d) What is meant by chemical interference in AAS?
- e) What is normal phase chromatography?
- g) The presence of chromium in sea water sample was analyzed using AAS along with six standards. Use calibration curve and find concentration of Cr in sea water.

Cr concentration $\mu\text{g dm}^3$	1.00	2.00	3.00	4.00	5.00	6.00	sample
Absorbance at $\lambda=358\text{nm}$	0.062	0.121	0.193	0.275	0.323	0.376	0.215

Q5) Attempt any two of the following (2/4)

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- a) State the types of liquid chromatography. Explain the liquid-solid chromatography.
- b) State Principle of GC. Draw schematic block diagram of gas chromatograph.
- c) Discuss in short partition theory of solvent extraction.
- d) Write a note on application of AAS.
