ROLL NO.....

CHE. 403/21

IV SEMESTER EXAMINATION, 2021

M.Sc. (CHEMISTRY)

PAPER-III

INSTRUMENTAL METHOD OF ANALYSIS

TIME: 3 HOURS **MAX.- 80**

MIN.- 16

Note: **The question paper consists of three sections A, B & C. All questions are compulsory.**
Section A- Attempt all multiple choice/answer in one word questions.
Section B- Attempt one question from each unit.
Section C- Attempt one question from each unit.

SECTION 'A' $2 \times 8 = 16$

Multiple Choice Questions/ Answer in one word

1. In size exclusion chromatography, solute molecules are separated based on ----------.

(a) molecular geometry & size (b) molecular composition

(c) molecular phase (d) molecular formula

2. In a chromatographic separation, which of the following is most appropriate for the qualitative analysis of a substance?

(a) Taking factor (b) Capacity factor

(c) Retention time (d) Resolution

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3. The measurement of intensity of fluorescent x ray provide a simple and ---------- way of --------- analysis. fill in the blanks –

(a) Destructive, Quantitative

(b) Non destructive, Quantitative

(c) Destructive, Qualitative

(d) Non destructive, Qualitative

4. In flame emission photometer the measurement of --------- issued for qualitative analysis -

(a) Colour (b) Intensity

(c) Velocity (d) Frequency

5. Which of the following is not an advantage of Laminar flow burner used in flame photometer-

(a) Noiseless

(b) Stable flame for analysis

(c) Efficient atomization of sample

(d) Sample containing two or more solvents can be burned efficiently.

6. In atomic emission spectroscopy the emission due to the electronic transition of -

(a) Singlet ground state to singlet exited state

(b) Singlet exited state to singlet ground state

(c) Singlet ground state to triplet exited state

(d) Triplet exited state to singlet ground state

OR

(a) Describe instrumentation of Proton induced x ray spectroscopy.

(b) Write only two applications of x ray fluorescent method.

UNIT-III

Q. 3. (a) Describe instrumentation of flame photometer.

(b) Write application of ICP-AES.

OR

(a) Describe instrumentation of ICP-AES.

(b) Write theory of ICP-AES.

UNIT-IV

Q. 4. (a) Write notes on Cold-vapor AAS.

(b) Write notes on hydride generation AAS.

OR

(a) Describe instrumentation of flame and graphite furnace AAS.

(b) Explain theory and application of flame and graphite furnace AAS.

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7. Which of the following is used as a source in atomic absorption spectroscopy-

(a) Tungstom halogen lamp (b) Hollow catrode lamp

(c) Xonon Arc (d) Globar

8. Cold vapor method is used for detection of-

(a) Cs (b) Hg (c) Ge (d) Cd

SECTION 'B' $4 \times 6 = 24$

Short Answer Type Questions (Word limit 200-250 words.)

UNIT-I

Q. 1. Write notes on capillary Electrophoresis.

OR

Explain the theory of size of exclusion chromatography.

UNIT-II

Q. 2. Write principles of x ray emission spectroscopy.

OR

Write theory of proton induced x ray spectroscopy.

UNIT-III

Q. 3. Write theory and application of flame photometer.

OR

Write selectivity, sensitivity and interferences of atomic spectroscopy.

UNIT-IV

Q. 4. Describe instrumentation of GC/HPLC/-MS hyphenated technique.

OR

Write application of GC/IC/HPLC-ICP-MS hyphenated technique.

SECTION 'C' $4 \times 10 = 40$

Long Answer questions (Word limit 400-450 words.)

UNIT-I

Q. 1. (a) Describe instrumentation of supercritical fluid chromatography.

(b) Explain Ion exchange equilibrium of Ion chromatography.

OR

(a) Write notes on capillary electro chromatography.

(b) Write properties of supercritical fluid chromatography.

UNIT-II

Q. 2. (a) Describe instrumentation of x ray emission spectroscopy.

(b) Write only two application of proton induced x ray spectroscopy.