OR

(a) What are the application of Atomic Absorption spectroscopy.

(b) Discuss the theory of HPLC.

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ROLL NO.....

CHE. 403/22

IV SEMESTER EXAMINATION, 2022

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. Ion exchange chromatography is used for the separation of -

(a) Non polar molecules (b) Polar molecules

(c) Both of above (d) None of above

2. Which of the following solvent is mostly utilized in supercritical fluid chromatography -

(a) Carbon Dioxide (b) Nitrogen oxide

(c) Ammonia (d) Ethane

3. In X-ray fluorescence spectrometer the relationship between the excitation intensity and the intensity of fluorescence does not depend on which of the following?

(a) Spectrum of the incident radiation

(b) Angle of radiance

(c) Molecular weight

(d) Incident angle

4. In X-ray emission tubes, X-ray is emitted by the acceleration of -

(a) Atoms (b) Protons

(c) Electrons (d) Neutrons

5. In atomic emission spectroscopy the emission occur due to the electric transition of -

(a) Singlet grounds state to singlet excited state

(b) Singlet excited state to singlet grounds state

(c) Singlet grounds state to triplet excited state

(d) Triplet excited state to singlet grounds state

6. In atomic emission spectroscopy the graph is drawn between -

(a) Emission Vs concentration

(b) Absorbance Vs Concentration

(c) Absorbance Vs Wavelength

(d) Emission Vs Wavelength

UNIT-II

Q. 2. (a) Describe analytics applications of X-ray emission spectroscopy.

(b) Discuss instrumentation of proton induced X-ray spectroscopy.

OR

(a) How X-ray fluorescent method is useful in qualitative analysis.

(b) Give the applications of proton induced X-ray spectroscopy.

UNIT-III

Q. 3. (a) Write short note on interference of atomic emission spectroscopy.

(b) Explain instrumentation of AES.

OR

(a) Describe the applications of flame photometer.

(b) Explain theory of ICP-AES.

UNIT-IV

Q. 4. (a) Discuss the applications of cold vapour and hydride generation AAS.

(b) Describe instrumentation of HPLC.

7. In atomic absorption spectroscopy (AAS) which of the following is generally used as radiation source?

(a) Tungsten lamp

(b) Xenon mercury arc lamp

(c) Hydrogen or deuterium discharge lamp

(d) Hallow cathode lamp

8. Which of the following is the function of the flame or emission system in Atomic Absorption Spectroscopy -

(a) To split the beam into two parts

(b) To break the steady light into pulsating light

(c) To filter unwanted components

(d) To reduce the sample into atomic state

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

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

UNIT-I

Q. 1. Explain inorganic applications of ion chromatography.

OR

What is the principle of supercritical fluid chromatography.

UNIT-II

Q. 2. Explain the theory of Proton induced X-ray spectroscopy.

OR

Write short note on principles of X-ray emission spectroscopy.

UNIT-III

Q. 3. Explain selectivity and sensitivity of atomic emission spectroscopy.

OR

Discuss instrumentation of flame photometer.

UNIT-IV

Q. 4. Write short note on flame and graphite furnace AAS.

OR

Explain the applications of HPLC.

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

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

UNIT-I

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

(b) Explain ion-exchange packing and ion exchange equilibrium in ion chromatography.

OR

(a) Give comparison of supercritical fluid chromatography with other types of chromatography.

(b) Discuss applications of SFC.