

C.U.SHAH UNIVERSITY**Summer Examination-2022****Subject Name: Quantitative Optical Spectroscopic Methods-II****Subject Code: 5SC04QSC1****Branch: M.Sc. (Chemistry)****Semester: 4****Date: 04/05/2022****Time: 11:00 To 02:00****Marks: 70****Instructions:**

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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SECTION – I

- Q-1 Attempt the following questions (07)**
- a. Define atomic absorption. **01**
 - b. Write temperature range for Acetylene-Air and Acetylene-Nitrous oxide flames. **01**
 - c. Define nebulizer. **01**
 - d. What do you mean by atomizer? **01**
 - e. Give the equation of Boltzmann distribution and write the names of terms involved in the equation. **01**
 - f. Write any two applications of ICP-AES. **01**
 - g. Give the full form of ICP-OES and MES. **01**
- Q-2 Attempt all questions (14)**
- a. Explain the Hollow Cathode Lamp and Electrodeless Discharge Lamp. **07**
 - b. Discuss the Instrumentation of ICP-AES. **07**
- OR**
- Q-2 Attempt all questions (14)**
- a. Write a note on flame atomizer. **07**
 - b. Discuss the Interferences in AAS and ICP-AES. **07**
- Q-3 Attempt all questions (14)**
- a. Write advantages, disadvantages and applications of AAS. **06**
 - b. Write a note on nebulizer and spray chamber used in ICP-AES. **05**
 - c. Give the difference between AAS and FES. **03**

OR



- Q-3 Attempt all questions (14)**
- a. Discuss the plasma torch and its types used in ICP-AES spectrometer. **06**
 - b. Explain graphite tube atomizer. **04**
 - c. Explain the CID detector used in ICP-AES spectrometer. **04**

SECTION – II

- Q-4 Attempt the following questions (07)**
- a. An atomic fluorescence spectrometer is capable of measuring samples containing both hydride forming elements and Mercury at a _____ level. **01**
 - b. What is called Atomic fluorescence spectroscopy? **01**
 - c. Define X-ray fluorescence **01**
 - d. Give the equation showing relation between concentration and intensity for AFS. **01**
 - e. Give any two types of fluorescence. **01**
 - f. What is known as "lock and key" effect in AFS? **01**
 - g. Write Bragg's law equation with name of all terms involved in the equation. **01**

- Q-5 Attempt all questions (14)**
- a. Explain the Instrumentation of atomic fluorescence spectroscopy. **07**
 - b. Give the advantages and disadvantages of XRF. **05**
 - c. Draw labeled diagram of proportional counter detector use in WD x-ray spectrometer. **02**

OR

- Q-5 Attempt all questions (14)**
- a. Discuss the instrumentation of X-Ray Fluorescence Spectrometry. **06**
 - b. Give the applications of atomic fluorescence spectroscopy. **04**
 - c. Write a note on the strength and limitations of XRF. **04**

- Q-6 Attempt all questions (14)**
- a. Explain the instrumentation of Energy Dispersive XRF spectrometers. **05**
 - b. Draw Jablonski diagram and explain various terms involved in the diagram. **05**
 - c. Write the comparison of ED and WD X-ray spectrometry. **04**

OR

- Q-6 Attempt all questions (14)**
- a. Explain the instrumentation of Wavelength Dispersive XRF spectrometers. **05**
 - b. Give the applications of XRF. **05**
 - c. Write a note on the micro XRF in detail. **04**

