

# C. U. SHAH UNIVERSITY

## Summer Examination-2022

Subject Name : Elements of Experimental Physics

Subject Code : 5SC04EEP1

Branch: M.Sc. (Physics)

Semester: 4

Date: 02/05/2022

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 Vacuum. **01**
- b. What is the relation between "Mean free path" and "Vacuum"? **01**
- c. What are the different units of vacuum? **01**
- d. Which elements are most commonly used as an X-ray source? **01**
- e. Define soft x-rays. **01**
- f. If the anode is Co then what will be the filter? **01**
- g. What do you mean by coherent scattering? **01**

**Q-2 Attempt all questions (14)**

- a. State the principle of Rotary Vane Pump. Discuss its construction, working, advantages-disadvantages and applications. **07**
- b. Narrate Diffusion Pump with its principle, construction, working, advantages-limitations and applications. **07**

**OR**

**Q-2 Attempt all questions (14)**

- a. State the principle of McLeod Gauge. Discuss its construction, working, advantages-disadvantages and applications. **07**
- b. Narrate any one of the thermal conductivity gauges giving principle, construction, working, advantages-limitations and applications. **07**

**Q-3 Attempt all questions (14)**

- a. Write the properties of X-rays. **07**
- b. What do you mean by X-ray sources and explain production of X-rays with necessary diagram. **07**

**OR**

**Q-3 Attempt all questions**

- a. Write a note on X-ray filter with examples. **07**



- b. Write a note on X-ray scattering by an electron and find the polarization factor. **07**

## SECTION – II

**Q-4 Attempt the Following questions (07)**

- a. What is the full form of TGA? **01**
- b. Name the two types of DSC techniques. **01**
- c. What do you mean by fluorescence? **01**
- d. Name the gas-filled radiation detectors. **01**
- e. Which radiation detector provides visual trajectory of a charged particle? **01**
- f. Define Resolving time in terms of the GM counter. **01**
- g. Define Spark Chambers. **01**

**Q-5 Attempt all questions (14)**

- a Explain in detail about the TGA technique with necessary diagram. **07**
- b Write a note on fluorescence spectroscopy with diagram. **07**

**OR**

**Q-5 Attempt all questions**

- a Write a note on DTA technique with necessary diagram. **07**
- b Explain XPS Spectroscopy in detail. **07**

**Q-6 Attempt all questions (14)**

- a Distinguish: Ionization Chamber versus Geiger Muller Counter. **07**
- b Write a detailed note on Cerenkov counters. **07**

**OR**

**Q-6 Attempt all Questions**

- a Explain the principle, construction and working of Scintillation detectors with the help of a schematic diagram. **07**
- b Explain briefly cloud chambers. How are they different from other detectors? **07**

