

- Bremsstrahlung radiations.
B. Explain the process of scattering of X-rays by electrons. (06)

OR

- Q-3 Attempt all questions [14]**
A. Explain the process of electron diffraction, how is it useful in analyzing if the sample is crystalline, polycrystalline or amorphous? (07)
B. Explain the process of scattering of X-Rays by an atom and a unit cell. (07)

SECTION – II

- Q-4 Attempt the Following questions [07]**
a. Why are Ge(Li) detectors maintained at liquid nitrogen temperature? (01)
b. State the principle on which gas filled detectors work. (01)
c. Why is Thallium doped in Sodium Iodide to use as a scintillation material? (01)
d. Why is it necessary to maintain low pressure for the proper functioning of a diffusion pump? (01)
e. Give the full form of D.T.A. (01)
f. What are gauges? (01)
g. Name any one characterization technique used to detect even trace elements in a sample. (01)

- Q-5 Attempt all questions [14]**
A. Explain the thermo gravimetric analysis technique used for the characterization of samples. (07)
B. Explain briefly power compensated and heat flux DSC. (07)

OR

- Q-5 Attempt all questions [14]**
A. Write a note on X-ray Photoelectron Spectroscopy (XPS). (08)
B. Explain the process of Phosphorescence. (06)

- Q-6 Attempt all questions [14]**
A. Explain the principle, construction and working of Geiger-Muller counters. Define quenching, dead time and recovery time. (10)
B. Write a detailed note on Cerenkov counters. (04)

OR

- Q-6 Attempt all Questions [14]**
A. Explain the principle, construction and working of Scintillation detectors with the help of a schematic diagram. (09)
B. Explain briefly cloud chambers. How are they different from other detectors? (05)

