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National Institute of Technology Hamirpur
Department of Materials Science and Engineering
End-Term Examinations (Odd Sem; 2023-24)
Characterization of Materials (MS-311)

Total Marks: 50

Time duration: 3 hrs

- 1) Write a note on construction and working of FTIR spectroscopy? [5]
- 2) Explain the working of thermogravimetric analysis (TGA) technique and draw typical TGA curves obtained for single stage and multistage decomposition. [5]
- 3) Why do we use an electron source in SEM for imaging? What are the different types of scattered electrons emitted in SEM and what kind of information about the specimen can be extracted from these emitted electrons? [1+5]
- 4) What is a Field Emission Source in SEM? Why do we prefer the same in comparison to other electron sources used in SEM? [4]
- 5) Write an elaborative note on principle, construction and working of TEM. [5]
- 6) What are the different types of scattering in RAMAN spectroscopy? Explain the principle and working of RAMAN Spectroscopy. [5]
- 7) Explain the technique of Wavelength Dispersive Spectroscopy (WDS) with the help of its schematic diagram. [5]
- 8) Write a descriptive note on the following terms. [3*5=15]
 - a) Type of lens system used in SEM.
 - b) Interaction volume in SEM (draw schematic as well)
 - c) Importance of sample preparation in TEM.
 - d) Bright field and Dark Field imaging in TEM
 - e) Full width and half maxima and its use in XRD