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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION DECEMBER 2018

Ph.D. (PHYSICS) Ist Semester

COURSE CODE: 13P1WPH112

MAX. MARKS: 35

COURSE NAME: Materials Characterization

COURSE CREDITS: 3

MAX. TIME: 2HR

Note: All questions are compulsory. Carrying mobile phone during examinations will be treated as a case of unfair means.

- Q.1. (a)** Which factors contribute to FWHM in XRD peak and how one can separate these factors? [2]
- (b)** How to perform quantitative phase analysis using XRD? [2]
- Q.2.** What are the practical applications of UV-Vis spectroscopy? Explain all the instrumentation of UV-Vis spectrometer. [5]
- Q.3.** Discuss analysis of SAED pattern and composition analysis for TEM studies. [4]
- Q.4.** Discuss Stokes shift, mirror image rule, invariance of emission wavelength with respect to excitation wavelength. [6]
- Q.5.** Explain quantum yield and life time in fluorescence spectroscopy with proper mathematical explanation. [4]
- Q.6.** What are the different modes in AFM imaging? Discuss each of them along with advantages and disadvantages. Write short notes on LFM, Phase imaging and MFM. [6]
- Q.7. (a)** What was the need to switch from IR analysis techniques to FTIR spectroscopy? [3]
- (b)** How interferograms being measured in FTIR spectroscopy? How to perform FT of interferogram. [3]