Dr Hari

Roll No:.....

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- March-April 2017

Ph.D I-Semester

COURSE CODE: 13P1WPH112 MAX. MARKS: 25

COURSE NAME: MATERIALS CHARACTERIZATION

COURSE CREDITS: 03 MAX. TIME: 1.5 Hrs

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

Q1. Answer briefly: **[1×5=5-marks]**

a. What is Glancing Incidence X-ray Diffraction (GIXRD)?

b. Define electron binding energy.

c. Differentiate emission and absorption with respect to optical spectroscopy.

d. Justify the name "Secondary Ion Mass Spectroscopy".

e. Differentiate electron diffraction and X-ray Diffraction.

Q2. Analyze critically the following with respect to electrical characterizations: **[2.5×2=5-marks]**

a. The nature of current (I)-voltage (V) curves for simple resistive and diode type devices.

b. The nature of capacitance (C)–voltage (V) curve.

Q3. Write short notes on: **[2.5×2=5-marks]**

a. Time domain spectroscopy

b. Quantum Hall Effect

Q4. What is a Plasmon? Explain Surface Plasmon Resonance (SPR). How to utilize SPR to study nanomaterials? **[(1+1+3)-marks]**

Q5. How will you use Raman spectroscopy to characterize carbon nanostructures? Elaborate quantitatively with at least two carbon nanostructures. **[5-marks]**