JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T1 EXAMINATION- FEBRUARY 2018
B.Tech (BT) IV Semester

COURSE CODE: 10B11PH212 MAX.MARKS: 15

COURSE NAME: BIO PHYSICAL TECHNIQUES MAX. TIME: 1 Hr

COURSE CREDITS: 4

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated in square brackets.

Q.1. Write short notes on: [0.5 x 6 =3]

(i) Essential parts of x-ray diffractometer

(ii) What can be determined from XRD data?

(iii) What is SEM?

(iv) Types of signals in SEM

(v) Why do we need vacuum in SEM?

(vi) Types of electron guns used in SEM

Q.2. What are the elementary steps in protein crystallography? Discuss the methods to grow protein crystals? [3]

Q.3. What are the advantageous of ESEM over conventional SEM? Explain the functioning of ESD or GSE? [3]

Q.4. In a simple cubic crystal [2]

(i) Find the ratio of intercepts of three axis by (123) plane.

(ii) Find the ratio of spacings of (110) and (111) plane.

Q.5. The following diffractometer data (expressed as 2θ) were generated from a specimen irradiated with Silver (Ag) K_α radiation. $2\theta = 14.10°$, $19.98°$, $24.57°$, $28.41°$, $31.85°$, $34.98°$, $37.89°$, $37.89°$, $40.61°$. (Given $\lambda = 4.17$ Å). [4]

(i) Determine the crystal structure.

(ii) Calculate the lattice constant.