

MCT
MANJARA CHARITABLE TRUST
RAJIV GANDHI INSTITUTE OF TECHNOLOGY

DATE: - 02/09/2015

TERM TEST NO.1

Marks: 40

Sub: Applied physics - I

Time: $1 \frac{1}{2}$ hrs

Q.1. Solve any 5 questions from the following. (3 marks each)

- a) Define space lattice, Unit cell and lattice parameter?
- b) Write difference between crystalline and amorphous solids?
- c) Explain the term ligancy & critical radius ratio in case of ionic crystal?
- d) What is crystal plane? Write procedure to determine the Miller indices of the crystal plane?
- e) Represent the following in cubic unit cell. (121), (002), [121]
- f) If the planes have intercepts in the ratio $3a:4b$ on X and Y axes and are parallel to Z axis, find the Miller indices of the set of parallel planes?
- g) The interplaner spacing of (100) plane is 2 AU for a FCC crystal. Find the atomic radius?

Q.2.

- a) Explain the diamond crystal structure & determine its packing efficiency? (8)
- b) State the conditions for stability of ionic crystal? Determine critical radius ratio for ligancy 6? (7)

OR

Q.2.

- a) Explain the HCP crystal structure & determine its packing efficiency? (8)
- b) If the interplaner spacing for the set of parallel planes (111) in Cu crystal is 2 AU, which has FCC structure, determine its density and atomic diameter. (7)
(Atomic weight of Cu is 63.54)

[PTO]

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Q.3.

- a) What is lattice constant of the unit cell? Derive the relation between density & lattice constant? (5)
- b) Explain Barium titanate crystal structure and give its importance? (5)

OR

Q.3.

- a) What is interplaner spacing? Derive the relation between interplaner spacing & lattice constant of the unit cell? (5)
- b) Explain NaCl crystal structure and determine its APF? (5)