

Jhargram Raj Collge

Department of Physics
Internal Assessment 2022
Third Semester Physics (Core Course) CBCS
Paper-CC-12T (Solid State Physics)
Full Marks -10

Attempt any **five** questions.

[5X2 = 10 Marks]

1. Show that for a simple cubic lattice $d_{100}: d_{110}: d_{111} = \sqrt{6} : \sqrt{3} : \sqrt{2}$ where d_{hkl} is the separation between the adjacent (hkl) parallel planes.
2. The density of bcc iron is 7.9 g/cm^3 and its atomic weight is 56. Calculate the length of the side of the cubic unit cell and its nearest neighbor distance.
3. The first order (100) reflection angle is 18° for a cubic crystal using X-rays of wavelength 1.54 \AA . Determine the distance between the (100) planes and the (111) planes of the crystal.
4. Explain different kinds of magnetism in solid with example.
5. What is paramagnetic Curie temperature?
6. Calculate the molar diamagnetic susceptibility of atomic hydrogen.
7. Apply Hund's rule to the ground state of a) Eu^{3+} b) Yb^{3+} c) Tb^{3+} .

Instructions:

Email the soft copy of your answer script to subhasreepadhan89@gmail.com by 5 pm 10.01.2022. Mention your name, roll no and subject code on top of the answer sheet and also in the subject of the mail.