



Department of Electrical and Electronic Engineering (EEE)

Level-3, Term-I

Mid Term Examination, Spring 2023

Course Code: EEE 309

Course Title: Electrical Properties of Materials

Notes:

Full Marks: 60

- a. Each question carries 30 marks. Time: 1 hour
- b. Figure on the right of each question indicate marks for respective question.
- c. Answer TWO (02). Including Question 1.

1. (a) What are the key characteristics and distinguish between unit cells and primitive cells, and how would you categorize them based on their properties? [09]
- (b) Compute the packing fraction for the following figure.1 (b), where the lattice constant is 5.5 angstroms. [09]

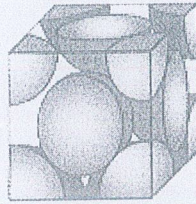


Figure.1 (b): FCC Lattice structure.

- (c) Analyze the following figure. 1(c), and also calculate the areal density of atom at (110) plane. [12]

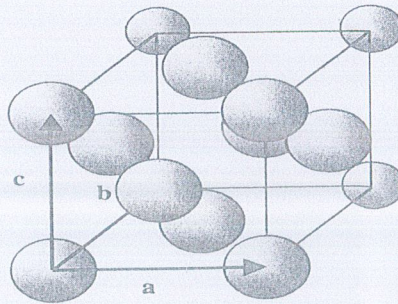


Figure.1(c)

2. (a) What are the basic differences between classical physics and quantum mechanics? Verify your answer. [15]
- (b) Derive the equation for radius of any arbitrary orbit. [15]

3. (a) Describe what causes materials to be magnetic. What renders it distinct? [15]
(b) Define magnetostriction with the help of an appropriate figure. [15]