Mar Athanasius College of Engineering, Kothamangalam

(Autonomous)

First Series Exam – August 2026

Mechanical Engineering - S3MB

B24ME2T03 - METALLURGY AND MATERIAL SCIENCE

Time: 1hr 30mints **Marks: 40**

PART-A (Answer all questions)

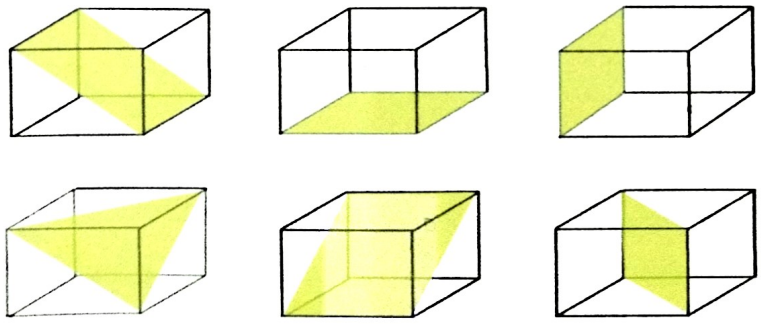
(4x3=12marks)

1. Explain the good electrical and thermal conductivity of metals with respect to their atomic bonding? **CO1**
2. Iron has a BCC crystal structure with an atomic radius of 0.124 nm. Atomic weight is 55.85 g/mol. Find its theoretical density. **CO1**
3. Explain the difference between Crystalline and Amorphous solids **CO2**
4. With neat sketches, define a grain and grain boundary. Explain the concepts of crystalline and polycrystalline materials with suitable diagrams. **CO2**

PART-B (Answer all questions)

(2 x14 = 28marks)

5. Estimate effective number of atoms, co-ordination number and atomic packing factor for BCC, FCC and HCP crystal structure. **CO1**
6. Explain the procedure to find Miller indices for a plane and Find the miller indices for the following planes **CO1**



VISION

❖ Mentoring to ensure excellence

MISSION

- To Facilitate comprehensive and integrated development of students by providing quality education that encourages sustainable practices
- To mould disciplined and socially committed engineers capable of assuming professional leadership upholding national integrity