PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester II - 2022   **Date :** 18-APR-2023
Course Code : MEC2016   **Time :** 9.30AM - 11.00AM
Course Name : Sem II - MEC2016 - Material Science and Metallurgy   **Max Marks :** 50
Program : MEC   **Weightage :** 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE FIVE QUESTIONS   5 X 2=10M

1. What is the Atomic Packing Factor for a FCC unit cell?
   a) 0.52   (CO1) [Knowledge]
   b) 0.68
   c) 0.74
   d) 0.86

2. Which one of the following is not a type of primary bonding?
   a) Covalent Bond   (CO1) [Knowledge]
   b) Ionic Bond
   c) Hydrogen Bond
   d) Metallic Bond

3. Which one of the following is the strongest of all bonds?
   a) Metallic Bond   (CO1) [Knowledge]
   b) Ionic Bond
   c) Covalent Bond
   d) Vanderwals Bond

4. _____ is defined as the chemically homogenous, physically different and mechanically seperable part of a system.
   a) Phase   (CO2) [Knowledge]
   b) State
   c) Compound

5. What is the solubility limit of sugar in water at 20^0 C?
   a) 55% wt Sugar   (CO2) [Knowledge]
   b) 60% wt Sugar
   c) 65% wt Sugar

PART B

ANSWER ALL THE TWO QUESTIONS   2 X 10 = 20M

6. Explain the following types of defects with the help of neat diagrams.
   a) Vacancy
   b) Interstitial and Substitutional defect

                                                                                   (CO1) [Comprehension]

7. Briefly explain the two fick's law of diffusion.

                                                                                   (CO2) [Comprehension]

PART C

ANSWER ALL THE TWO QUESTIONS   2 X 10 = 20M

8. For the following miller indices for planes, show its corresponding plane in a simple cubic unit cell.
   a) (0 0 1)
   b) (1 1 1)
   c) (1 0 0)
   d) (0 1 0)
   e) (1 1 0)

                                                                                       (CO1) [Application]

9. For the following miller indices for vectors, show its corresponding vector in a simple cubic unit cell.
   a) [1 1 1]
   b) [1 1 2]
   c) [2 1 1]
   d) [1 2 1]
   e) [2 2 2]

                                                                                       (CO1) [Application]