Roll No

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - MAY 2023

Semester : Semester II - B.Tech PHY - 2022

Course Code : PHY1001

Course Name : Sem II - PHY1001 - Material Physics

Program : Physics for B.Tech

Date : 18-MAY-2023

Time : 2.00 PM - 3.30 PM

Max Marks : 50

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 QUESTIONS   (5 X 2 = 10M)

1. An iron bar 3 m long is stretches by 0.5 mm. Compute the strain.

    (CO2) [Knowledge]

2. Write the stacking sequence of the atomic arrangement for FCC and HCP structures.

    (CO1) [Knowledge]

3. Calculate the interplanar spacing of (100), (110) and (111) planes for a simple cubic structure?

    (CO1) [Knowledge]

4. Define coordination number and packing factor?

    (CO1) [Knowledge]

5. What is the modulus of rigidity (shear modulus)?

    (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS   (4 X 5 = 20M)

6. Explain the possible point defects in metals and ceramics in detail?

    (CO1) [Comprehension]

7. A weight of 200 kg is suspended by vertical wire of length 600 cm. The area of cross-section of wire is $1 X 10^{-6} m^2$. When the load is removed, the wire contracts by 0.5 cm. The Young's modulus of the material of wire will be?

<div align="right">(CO2) [Comprehension]</div>

8. Steel and copper wires of the same length and radius are stretched by the same weight one after the other. Young's modulus of steel and copper are $2 X 10^{11} N/m^2$ and $1.2 X 10^{11} N/m^2$ respectively. The ratio of increase in length?

<div align="right">(CO2) [Comprehension]</div>

9. How crystalline solids are different from amorphous (Non-crystalline) solids ?

<div align="right">(CO1) [Comprehension]</div>

PART C

ANSWER ALL THE QUESTIONS   (2 X 10 = 20M)

10. (a) Describe the cubic, tetragonal, and hexagonal crystal systems. (6 Marks)
    (b) What are one-dimensional defects. Explain in a few words. (4 Marks)

<div align="right">(CO1) [Application]</div>

11. A beam of X-rays of wavelength 0.071 nm is diffracted by a (110) plane of NaCl with a lattice constant of 0.28 nm. Find the diffracting angle for the second order diffraction.

<div align="right">(CO1) [Application]</div>