Week 0 : Assignment 0

The due date for submitting this assignment has passed.

Due on 2021-07-26, 23:59 IST.

As per our records you have not submitted this assignment.

1) The mechanical properties of metallic materials depend on: *1 point*

- (a) Grain size and dislocations
- (b) secondary phase
- (c) precipitates
- (d) Texture

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Grain size and dislocations
(b) secondary phase
(c) precipitates
(d) Texture

2) The number of independent elastic constants required to define the stress-strain relationship for an isotropic elastic solid is: *1 point*

- (a) 2
- (b) 3
- (c) 5
- (c) 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) 2

3) Modulus of Elasticity of a single FCC crystal: *1 point*

- (a) Will not vary with direction in the crystal lattice as it is a material property.
- (b) Will vary along [111], [110] and [100] direction due to difference in distance between atoms.
- (c) Depends on the binding forces of atoms.
- (d) Depends on the dislocation structure and stacking fault energy of the material.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(b) Will vary along [111], [110] and [100] direction due to difference in distance between atoms.
(c) Depends on the binding forces of atoms.

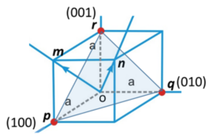
4) Which of the statements are true? *1 point*

- (a) Unit cell is the smallest group of atom that indicates the crystal symmetry
- (b) There are 7 possible crystal systems
- (c) The 14 Bravais lattices are the possible combination of the 7 crystal system
- (d) Each crystal has its inherent rotational, mirror, inversion, and translational symmetry

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Unit cell is the smallest group of atom that indicates the crystal symmetry
(b) There are 7 possible crystal systems
(c) The 14 Bravais lattices are the possible combination of the 7 crystal system
(d) Each crystal has its inherent rotational, mirror, inversion, and translational symmetry

5) **Find the miller indices of the plane – pqr, and the directions –on and om** *1 point*



(a) pqr → (111) , om→ $[101]$, on→ $[111]$
(b) pqr → $(11\bar{1})$, om→ $[10\bar{1}]$, on→ $[\bar{1}11]$
(c) pqr → $(1\bar{1}1)$, om→ $[101]$, on→ $[11\bar{1}]$
(d) pqr → $(\bar{1}11)$, om→ $[101]$, on→ $[111]$

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a)

6) Which kind of radiation can be used for the X-Ray diffraction (XRD) phenomena? *1 point*

- (a) Continuous X-Ray
- (b) Characteristics X-Ray
- (c) Monochromatic X-ray
- (d) Bremsstrahlung radiation

No, the answer is incorrect.
Score: 0

Accepted Answers:
(b) Characteristics X-Ray
(c) Monochromatic X-ray

7) **Crystallographic planes $(1\bar{2}\bar{1})$, $(3\bar{2}1)$ and $(0\bar{1}\bar{1})$ belongs to which zone axis?** *1 point*

(a) 111
(b) $\bar{1}11$
(c) $1\bar{1}1$
(d) $11\bar{1}$

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(d)

8) **What is the required wavelength of the radiation to diffract a $2\bar{2}2$ plane with lattice parameter a=2.866A°, and Bragg's angle (2θ) of 120°?** *1 point*

(a) 1.343 A°
(b) 1.543 A°
(c) 2.866 A°
(d) 1.433 A°

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(d)

9) Which of the following radiations can be used for diffraction in crystalline materials? *1 point*

- (a) Electrons
- (b) X-Rays
- (c) Light
- (d) Neutrons

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Electrons
(b) X-Rays
(d) Neutrons

10) What is Anisotropy in polycrystalline materials? *1 point*

- (a) Variation in the material properties with respect to sample directions
- (b) Variation in Yield Strength due to Bauschinger Effect
- (c) Variation in the crystal structure
- (d) Variation in the spin of the electrons

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Variation in the material properties with respect to sample directions