Assignment 3

The due date for submitting this assignment has passed.

Due on 2021-12-22, 23:59 IST.

As per our records you have not submitted this assignment.

1. Materials will fail if pure compression because of the repulsive and other forces when the atoms come close. State true or false
   - True
   - False
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: True

2. Which amongst the following is the correct order of the strength of the bonds, in grams?
   - Hydrogen = Covalent
   - Hydrogen = Covalent
   - Hydrogen = Covalent
   - Hydrogen = Ionic
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: Hydrogen = Covalent

A rare metal found on earth has an atomic mass of 183.4 g/mol and has two equivalent atoms in its unit cell. Using this information, answer the questions from 3 to 5.

3. The lattice structure of the metal is
   - FCC
   - BCC
   - HCP
   - RCP
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: FCC

4. Which of the following is the radius (r) of an atom in the metal? Assume the density of the metal as 18.39 g/cm³
   - 1.38 pm
   - 1.77 pm
   - 1.77 pm
   - 1.13 pm
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: 1.13 pm

5. Which of the following is the edge length (a) of the crystal lattice? (Use the relation: \( a/\sqrt{2} = 4r \))
   - 0.314 nm
   - 5.14 nm
   - 0.367 nm
   - 0.408 nm
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: 0.314 nm

During the excavation for a pile foundation, kaolinite and montmorillonite clay soils were encountered at two distinct locations. The location where montmorillonite clay was encountered was excluded for construction, and its expansion in nature. Choose the lattice defect type attributed to this property of montmorillonite.

   - Point defect
   - Line defect
   - Surface defect
   - Volume defect
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: Surface defect

A and C are two samples of the same metallic material. Sample A was subjected to annealing, and Sample B was subjected to hardening. Using this information, which of the following is true correct?

   - A has a smaller grain size and higher strength than B.
   - A has a large grain size and shorter grain boundaries than B.
   - A has a smaller grain size and longer grain boundaries than B.
   - A has a larger grain size and longer grain boundaries than B.
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: A has a larger grain size and shorter boundaries than B.

Consude the following three statements:

A. Silicon is brittle in nature and ambient temperature,
B. Bonded bonds are present in silicon,
C. Covalent bonds are directional in nature.

Which of the following is the most appropriate answer that best describes these statements?

   - A is incorrect, and B and C are correct, B is the proper reasoning for A
   - B is incorrect, and A and C are correct, and C is the proper reasoning for A
   - C is incorrect, A and B are correct, and A is the proper reasoning for B
   - A is incorrect, B and C are correct, and C is the proper reasoning for A
   Yes, the answer is incorrect.
   Score: 0
   Accepted Answers: A is incorrect, and B and C are correct, B is the proper reasoning for A

Figure 1 shows the relation between the electronic particle distance and lattice energy of two different materials – Material A and B. The coefficient of thermal expansion of Material A is higher than that of Material A.