Quiz 1

Total points 0/15

Physics of Materials PHY1000

The respondent's email (**ec20b1042@iiitdm.ac.in**) was recorded on submission of this form.

Declaration of Academic Integrity

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"I (Name of student)---------- declared that, have not copied any of the answer(s) in any quiz/exam from any online/offline sources/ friend(s). If found so, I am aware of the fact that, violation of this is regarded as cheating and can result in cancelation of my quiz/exam".

Name and Roll Number of Student *

B Srinidhi - EC20B1042

MCQ

0 of 2 points

✗ MCQ ···/2

In which of the cases below does A have a higher static dielectric constant than B, assuming that both A and B are dielectrics? (note that more than one answer may be correct)

- (●) a) A has a higher permittivity than B. ✗
- ( ) b) A is a non-polar gas; B is a polar gas.
- ( ) c) Two capacitors, X and Y, have identical geometry. Capacitor X contains a sample of A and has a capacitance of 200 nF. Capacitor Y contains a sample of B and has a capacitance of 0.6 μF.
- ( ) d) A is a sample of water at a temperature of 20 °C; B is a sample of water at a temperature of 80 °C.
- ( ) e) An electric field of strength 1000 V m-1 passes through both A and B. The field strength is reduced less on passing through A than it is on passing through B.

No correct answers

MCQ 0 of 1 points

✗ ···/1

According to the Wiedemann-Franz law, which of the following is true?

- ( ) a) thermal conductivity is inversely proportional to electrical conductivity in all materials.
- ( ) b) thermal conductivity is proportional to electrical conductivity in all materials.
- ( ) c) thermal conductivity is inversely proportional to electrical conductivity in metals.
- (●) d) thermal conductivity is proportional to electrical conductivity in metals. ✗

No correct answers

MCQ 0 of 2 points

✗ ···/2

Which of the following statements about electrical conduction in nearly pure materials are true?

- a) At low temperatures, resistivity decreases to zero as the lattice no longer interferes with electron motion.
- b) At low temperatures, conductivity decreases to a minimum based on residual lattice defects.
- c) Dislocations and grain boundaries provide a low resistance route for electrons to travel through a material.
- d) At higher temperatures, the scattering effect of thermal phonons swamps that of residual lattice defects.
- e) At low temperatures, conductivity increases with the addition of high valency atoms to the bulk lattice, as they provide more electrons to the lattice.
- ◉ f) At low temperatures conductivity does not increase beyond a maximum due to imperfections in at the lattice scattering electrons. ✗

No correct answers

MCQ 0 of 1 points

✗ ···/1

Seebeck Effect is the conversion of heat energy into

- ◉ a) Electrical energy ✗
- b) Mechanical energy
- c) Heat energy
- d) None of above.

No correct answers

MCQ 0 of 1 points

✗ ···/1

Why is window glass transparent?

- a) Because it has a single crystal structure and each sheet is cut with the optic axis normal to the plane of the window.
- b) Because it has an amorphous structure with large interatomic spacing. Light waves can pass between widely spaced atoms without any interaction with the solid structure.
- c) Because sheets of glass are cut thin enough for light to pass through without any significant absorption.
- ◉ d) Because of the electronic nature of the bonds between the atoms in the glass. ✗

No correct answers

MCQ 0 of 1 points

✗ ···/1

Which property characterizes superconductivity along with zero electrical resistance?

- a) Perfect ferromagnetism
- b) Perfect paramagnetism
- ◉ c) Perfect diamagnetism ✗
- d) The expulsion of any applied magnetic field

No correct answers

MCQ 0 of 1 points

✗ ···/1

Using the assumptions in the Free electron model, how do crystal lattices affect electrons?

- a) The lattice is not taken into account, lattice imperfections and defects are ignored.
- b) The lattice is not taken into account, but lattice imperfections and defects may scatter electrons. ✗
- c) The lattice and any defects are taken into account and are able to scatter electrons.

No correct answers

MCQ 0 of 1 points

✗ ···/1

Which one of the following statements is true:

- a) Protons and neutrons have orbital and spin angular momentum ✗
- b) Protons have orbital and spin angular momentum, neutrons have spin angular momentum
- c) Protons and neutrons possess orbital angular momentum only
- d) Protons and neutrons possess spin angular momentum only

No correct answers

MCQ 0 of 1 points

✗ ···/1

In the tight binding approximation, as a starting point

- a) Electrons are free and atoms are bound to their crystallographic locations.
- b) Atoms are free and electrons are bound to their respective atoms ✗
- c) Both atoms as well as electrons are free
- d) Both atoms are electrons are bound

No correct answers

MCQ 0 of 2 points

✗ ···/2

Higher the Fermi energy

- a) Higher is the number of states with that energy
- b) Higher is the temperature required to changes the occupancy levels of states near the Fermi energy to the same extent
- c) Higher is the energy with which electrons are bound to the atoms ✗
- d) Lower is the temperature required to change the occupancy levels of the states near the Fermi energy to the same extent.

No correct answers

MCQ 0 of 2 points

···/2

The Maxwell-Boltzmann distribution indicates that as the temperature increases

- a) Higher energy states are increasingly unoccupied.
- b) Higher energy states are increasingly occupied.
- c) Lower energy states are increasingly occupied
- d) For lower energy states, there is no change in the level of occupancy.

No correct answers