

Unit 13 - Week 12

Course outline

How to access the portal?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

 Magnetic Properties

 Electron Compounds; Phonons, Optoelectronic Materials

 Superconductivity

 Bose-Einstein Statistics

 Quiz : Assignment 12

 Week 12 Feedback

Week 13

VIDEO DOWNLOAD

Text Transcripts

Assignment 12

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

Note : More than one answer may be right. Partial marks awarded if only some of the correct answers are selected. No marks awarded if even one of the wrong answers is selected:

1) Match the following:

1 point

(A)	Susceptibility	(i)	A/m ²
(B)	Magnetic flux density	(ii)	Henries A/m ²
(C)	Bohr magneton	(iii)	Unitless
(D)	Neon gas	(iv)	Vector quantity
(E)	Magnetic moment	(v)	Net moment zero

- A(iii), B(ii), C(i), D(v), E(iv)
 A(ii), B(iv), C(i), D(v), E(ii)
 A(ii), B(iv), C(i), D(v), E(iii)
 A(iii), B(iv), C(ii), D(v), E(i)

No, the answer is incorrect. Score: 0

Accepted Answers:

A(iii), B(ii), C(i), D(v), E(iv)

2) Order of magnetic susceptibility for a diamagnetic material, paramagnetic and ferromagnetic materials are ____, ____, and ____, respectively.

1 point

- $\sim 10^{-9}, \sim 10^{-7}, \sim 10^6$
 $\sim -10^{-7}, \sim 10^{-7}, \sim 10^6$
 $\sim 10^{-7}, \sim 10^{-9}, \sim 10^6$
 $\sim 10^{-7}, \sim 10^{-7}, \sim 10^9$

No, the answer is incorrect. Score: 0

Accepted Answers:

$\sim -10^{-7}, \sim 10^{-7}, \sim 10^6$

3) Transformers magnetic material shows ____initial permeability than magnetic storage device materials.

1 point

- Larger
 Smaller
 Equal
 Lower

No, the answer is incorrect. Score: 0

Accepted Answers:

Larger

4) Some phonons in a material respond to ____ radiation. These are called ____active phonon.

1 point

- Infrared, optical
 Near infrared, acoustic
 Far infrared, optical
 Visible, acoustic

No, the answer is incorrect. Score: 0

Accepted Answers:

Infrared, optical

This question consists of two parts

5) In a material that shows a direct bandgap, energy of light absorbed depends on the ____ while the photons absorbed per unit area depends on the ____ in the process.

0.5 points

- Probability of interaction of an electron with photon, transition steps
 Band gap, Probability of interaction of an electron with phonon
 Band gap, number of transitions
 Photon transition energy, Phonon transition energy

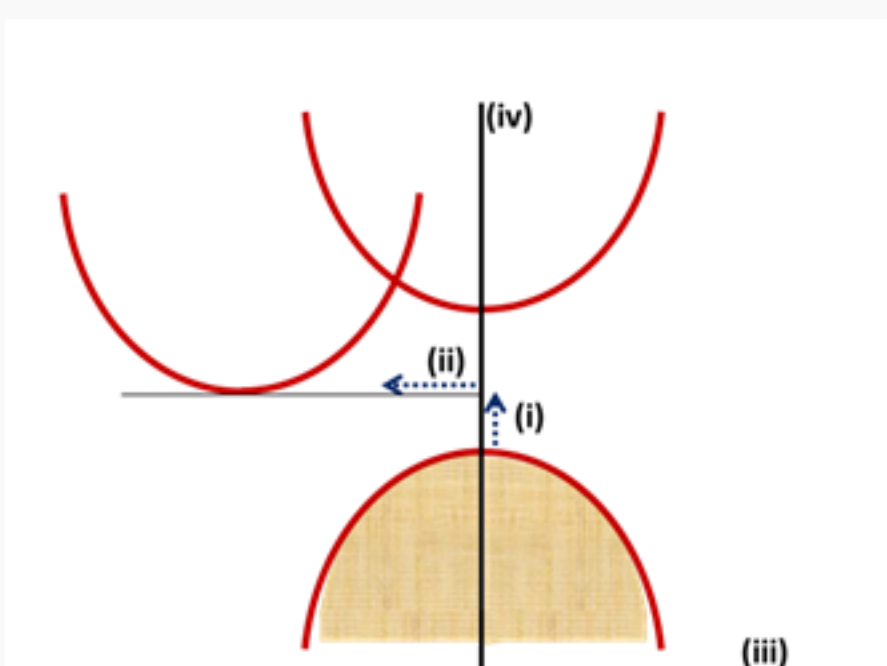
No, the answer is incorrect. Score: 0

Accepted Answers:

Band gap, number of transitions

6) Name the marked points "(i), (ii), (iii), and (iv)" as mentioned in the below given figure.

0.5 points



- Phonon transition, photon transition, energy, wave-vector
 Photon transition, phonon transition, wave-vector, energy
 Band gap, location gap, energy, wave-vector
 Location gap, band gap, wave-vector, energy

No, the answer is incorrect. Score: 0

Accepted Answers:

Photon transition, phonon transition, wave-vector, energy

7) What is common between MRI and particle accelerators?

1 point

- Superconductor
 Photons released
 Cooper pair
 Photoelectric effect

No, the answer is incorrect. Score: 0

Accepted Answers:

Superconductor

Cooper pair

8) Superconducting state to normal state transition is ____in type II and ____in type I superconductors.

1 point

- Abrupt, gradual
 Gradual, abrupt
 Not observed, observed
 Observed, not observed

No, the answer is incorrect. Score: 0

Accepted Answers:

Gradual, abrupt

9) Cooper pair can form when electrons are several ____ apart and interact through the__.

1 point

- nm, lattice phonons
 nm, photons
 Å, lattice photons
 Å, incident electrons

No, the answer is incorrect. Score: 0

Accepted Answers:

nm, lattice phonons

10) Match the following:

1 point

(A)	Photons	(i)	Particles of sound
(B)	Phonons	(ii)	Zero integer spin
(C)	Cooper pair	(iii)	Boson
(D)	Higgs particle	(iv)	Particles of light

- A(iv), B(i) C(ii), D(iii)
 A(iv), B(i) C(iii), D(ii)
 A(ii), B(i) C(iv), D(iii)
 A(iv), B(iii) C(ii), D(i)

No, the answer is incorrect. Score: 0

Accepted Answers:

A(iv), B(i) C(ii), D(iii)

11) Superconducting state of a material is decided by three parameters: ____, and __.

1 point

- Magnetic field, temperature, current density
 Magnetic field, temperature, current
 Electric field, current, temperature
 Current density, temperature, gravitational field

No, the answer is incorrect. Score: 0

Accepted Answers:

Magnetic field, temperature, current density