

Unit 8 - Week 7

Course outline

How to access the portal?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Anisotropy and Periodic Potential in a Solid

Confinement and Quantization: Part 1

Confinement and Quantization: Part 2

Quiz : Assignment 7

Physics of Materials : Week 7 Feedback Form

Week 8

Week 9

Week 10

Week 11

Week 12

Week 13

VIDEO DOWNLOAD

Text Transcripts

Assignment 7

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

Due on 2019-09-18, 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) _____ shows perfect atomic orientation and different properties in different directions. 1 point
- Single crystal
 - Polycrystal having few large crystals
 - Polycrystal having smaller crystals
 - Polycrystal having smaller size crystals with random orientation

No, the answer is incorrect. Score: 0

Accepted Answers: *Single crystal*

- 2) Polycrystals with much smaller size and randomly oriented crystals have _____ properties while graphene materials shows _____ properties. 1 point
- Anisotropic, isotropic
 - Isotropic, anisotropic
 - Anisotropic, Anisotropic
 - Isotropic, Isotropic

No, the answer is incorrect. Score: 0

Accepted Answers: *Isotropic, anisotropic*

- 3) Ionic core in a solid was ignored in____ 1 point
- Drude model
 - Drude-Sommerfeld model
 - Infinite potential well measurement
 - None

No, the answer is incorrect. Score: 0

Accepted Answers: *Drude model*
Drude-Sommerfeld model

- 4) When electron passes from one end to another end in a solid, it feels different environment because of 1 point
- Ionic core
 - Free electron
 - Nearly free electron
 - Bound electron

No, the answer is incorrect. Score: 0

Accepted Answers: *Ionic core*
Free electron
Nearly free electron
Bound electron

- 5) Potential energy of a free electron approaching towards ionic core _____ and at infinity becomes _____. 1 point
- Decreases, Zero
 - Infinity, Zero
 - Increases, Zero
 - None

No, the answer is incorrect. Score: 0

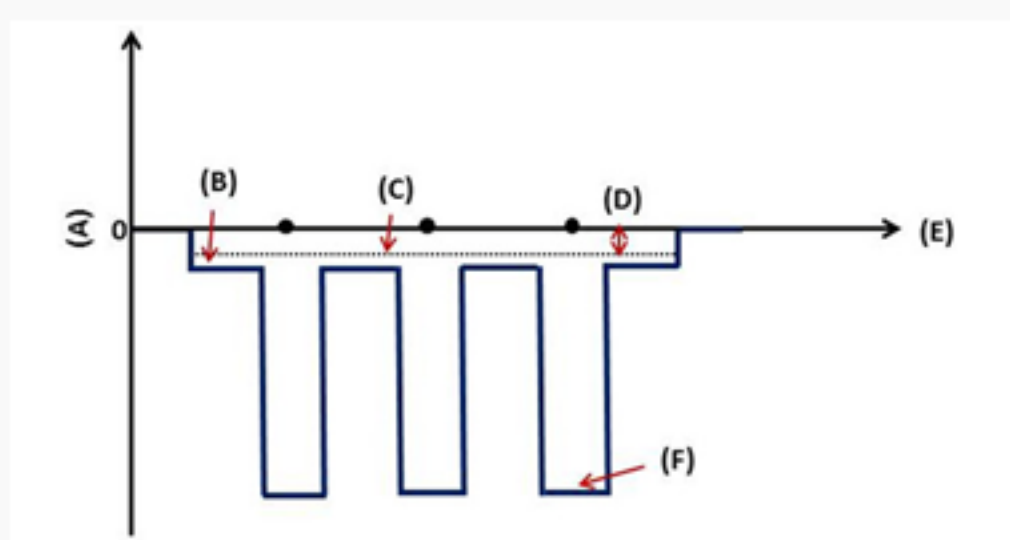
Accepted Answers: *Decreases, Zero*

- 6) In a meter long solid, nearly free electrons are _____ and bound electrons are _____. 1 point
- Free to run across the solid, confined to the ionic core
 - Confined to few angstroms, free to move within 1meter distance,
 - Confined to the ionic core, free to run across the solid
 - Free to move within 1meter distance, confined to few angstroms

No, the answer is incorrect. Score: 0

Accepted Answers: *Free to run across the solid, confined to the ionic core*
Free to move within 1meter distance, confined to few angstroms

- 7) Mark the following points in the below given figure: 1 point



- Nearly free electron, potential energy, bound electron, lattice position, Fermi energy, work function
- Potential energy, Nearly free electron, Fermi energy, work function, lattice position, bound electron
- Nearly free electron, bound electron, lattice position, Fermi energy, work function, potential energy
- Bound electron Nearly free electron, potential energy, lattice position, Fermi energy, work function

No, the answer is incorrect. Score: 0

Accepted Answers: *Potential energy, Nearly free electron, Fermi energy, work function, lattice position, bound electron*

- 8) Energy levels are more closely spaced in _____ than _____ because of _____. 1 point
- Nearly free electron, bound electron, large potential
 - Bound electron, nearly free electron, large potential
 - Nearly free electron, bound electron, large confinement range
 - Bound electron, nearly free electron, large confinement range

No, the answer is incorrect. Score: 0

Accepted Answers: *Nearly free electron, bound electron, large confinement range*

- 9) The table below shows a condition and a result due to the condition. Based on these pick the choice(s) that apply: 1 point

	Condition	Result
(A)	Truly free electron	No restriction on λ that can be supported
(B)	Electron confined in a potential well	Any discrete set of λ can be supported.

- Both A and B are true
- Both A and B are false
- A is false, B is true
- A is true, B is false

No, the answer is incorrect. Score: 0

Accepted Answers: *A is true, B is false*

- 10) Schrodinger wave equation $-\frac{\hbar^2}{2m} \frac{d^2\psi(x)}{dx^2} + V(x)\psi(x) = E\psi(x)$ is the sum of _____. 1 point

- Free energy of all electron
- Kinetic energy and potential energy
- Kinetic energy of bound electrons
- Potential energy of bound electrons

No, the answer is incorrect. Score: 0

Accepted Answers: *Kinetic energy and potential energy*