

Unit 6 - Week 5

Course outline

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Week 5

History of Quantum Mechanics- 1

History of Quantum Mechanics-2

Introduction to Drude Sommerfeld model

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Physics of Materials : Week 5 Feedback Form

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Assignment 5

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

Due on 2019-09-04, 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) Kirchhoff's law with respect to is about _____. 1 point
- Photoelectric effect
 Black body radiation
 Zeeman effect
 Thermal conductivity

No, the answer is incorrect.
Score: 0

Accepted Answers:
Black body radiation

- 2) Human body emits ____ radiation 1 point
- Ultraviolet
 Visible
 Infrared
 Microwave

No, the answer is incorrect.
Score: 0

Accepted Answers:
Infrared

- 3) Compton theory is based on the collision between an electron and a _____. 1 point
- Photon
 Electron
 Neutron
 Proton

No, the answer is incorrect.
Score: 0

Accepted Answers:
Photon

- 4) Classical physics failed to explain the _____ because of the quantum mechanical nature of the particle. 1 point
- Photoelectric effect
 Modified Compton effect
 Discrete spectra of atom and molecule
 All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

- 5) Match the following: 1 point

	Law		Expression
1.	Planck's law	(a)	$\lambda_{\max}T = \text{constant}$
2.	Stefan Boltzmann law	(b)	$R(\lambda, T) = \frac{8\pi kT}{\lambda^4}$
3.	Wein's displacement law	(c)	$I(T) = \sigma T^4$
4.	Rayleigh-Jean law	(d)	$R(\lambda, T) = \frac{8\pi ch}{\lambda^5} \frac{1}{e^{hc/\lambda kT} - 1}$

- 1d, 2c, 3a, 4b
 1b, 2a, 3d, 4c
 1b, 2a, 3c, 4d
 1c, 2a, 3d, 4b

No, the answer is incorrect.
Score: 0

Accepted Answers:
1d, 2c, 3a, 4b

- 6) Match the following: 1 point

	Constants		Values
1.	Planck's constant	(a)	$3.0 \times 10^8 \text{ m.s}^{-1}$
2.	Stefan-Boltzmann constant	(b)	$1.38 \times 10^{-23} \text{ m}^2 \text{ kg s}^{-2} \text{ K}^{-1}$
3.	Speed of light	(c)	$6.626 \times 10^{-34} \text{ J.s}$
4.	Boltzmann constant	(d)	$5.67 \times 10^{-8} \text{ Wm}^{-2} \text{ K}^{-4}$

- 1c, 2d, 3a, 4b
 1b, 2c, 3a, 4d
 1a, 2b, 3c, 4d
 1d, 2b, 3a, 4c

No, the answer is incorrect.
Score: 0

Accepted Answers:
1c, 2d, 3a, 4b

- 7) Match the Following: 1 point

	Physicist		Findings
1.	Max Planck	(a)	Wave equation
2.	Louis de Broglie	(b)	Uncertainty principle
3.	Erwin Schrodinger	(c)	Quantization of energy
4.	Max Born	(d)	Light can be treated as particle
5.	Werner Heisenberg	(e)	Wave-particle duality
6.	Albert Einstein	(f)	Interpretation for wave-function

- 1c, 2e, 3a, 4f, 5b, 6d
 1a, 2d, 3f, 4c, 5d, 6e
 1a, 2c, 3b, ad, 5f, 6e
 1e, 2f, 3a, 4b, 5c, 6d

No, the answer is incorrect.
Score: 0

Accepted Answers:
1c, 2e, 3a, 4f, 5b, 6d

- 8) What is common between Drude and Drude-Sommerfeld model? 1 point
- Both use the concept of free electron model
 Both models apply quantum mechanical principles
 Both models incorporates Paul's exclusion principle
 Both models assumes that potential is constant within the solid

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both use the concept of free electron model
Both models assumes that potential is constant within the solid

- 9) Fermions are the particles which are/have 1 point
- Identical and indistinguishable
 Identical and distinguishable
 Half-integer spin
 Integer spin

No, the answer is incorrect.
Score: 0

Accepted Answers:
Identical and indistinguishable
Half-integer spin

- 10) Drude-Sommerfeld model and Drude model follows _____ respectively 1 point
- Maxwell-Boltzmann Statistics and Fermi-Dirac Statistics
 Fermi-Dirac Statistics and Maxwell-Boltzmann Statistics
 Bose Statistics and Maxwell Boltzmann Statistics
 Fermi-Dirac Statistics and Bose Statistics

No, the answer is incorrect.
Score: 0

Accepted Answers:
Fermi-Dirac Statistics and Maxwell-Boltzmann Statistics