

V. P. & R. P. T. P. Science College

Vallabh Vidyanagar 388 120

T. Y. B. Sc. (Sem-5) Examination,

First Internal Test

Thursday, 3rd October, 2013,

time: 3.30 p.m. to 5.30 p.m.

PHYSICS: P-303, Solid State Physics

Marks: 30

Q-1 Multiple Choice Question

06

- I. The energy of X-ray used for crystal diffraction experiments are
(a) 10 to 50 eV (c) 10 to 50 KeV
(b) 10 to 50 MeV (d) 10 to 50 GeV
- II. The dimension of the crystal used in the Laue method is greater than
(a) 1 cm (c) 1 mm
(b) 1 nm (d) 1 m
- III. According to the free electron theory, the _____ electron is roaming in the metal.
(a) Conduction (c) ionized
(b) Valence (d) core
- IV. Missioner effect found in _____
(a) Type – I superconductor (c) Type – II superconductor
(b) Type – I and type –II superconductor (d) In any superconductor
- V. Pure semiconductors are insulator at _____ temperature.
(a) -450 K (c) Absolute zero
(b) -145 K (d) Room
- VI. In the intrinsic semiconductors, the acceptor levels are close to
(a) Fermi Band (c) Conduction band
(b) Dirac Band (d) Valence band

Q-2 Attempt any three questions each of two marks

06

- 1 When electron diffraction techniques are used.
- 2 What is BCC, FCC and HCP structures?
- 3 What is Fermi Energy?
- 4 What is Hall Effect?
- 5 What is intrinsic semiconductor?
- 6 What is photovoltaic effect?

Q-3 a Explain the geometrical construction of reciprocal space.

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OR

a Discuss the Ewald's construction.

06

Q-4 a Explain Drude Model of free electron.

06

OR

a What is superconductivity? Discuss Type – I and type – II superconductors.

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Q-5 a Discuss n-type semiconductor with energy level diagram.

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OR

Explain the metal- semiconductor junction theory with energy level diagram.

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