MAY 2008

2008 MAHARSHI DAYANAND UNIVERSITY
B.E/ B.TECH I I SEMESTER REGULAR EXAMINATION
MECHANICAL ENGINEERING
PHYSICS - II

TIME : 3 HOUR
MARK : 80

ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS

Q1(a)What are miller indices?Give their significance.How would you determine the miller indices of a plane in a crystal ?

(b)What are point defects in solids?DErive an expression for the concentration of scottky defects at equilibrum temperature.

Q2(a)What is planck"s constant?Discuss its significance.

(b)Derive time independent schrodinger wave equation for a free particle.

Q3(a)Discuss th motion of a free electron in a periodic potential and discussFermiDirac distribution function.

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(b)What is density of states?Dicuss briefly.

Q4)Write notes on any two:

(a)Xray diffraction powder method for crystal structure analysis.

(b)Thermionic Emmission,

(c)Drude theory of conduction.

Q5)Discuss briefly

(a)Origin of energy bands.

(b)E-k diagrams,and

(c)Brillouin zones.

Q6(a)What is photo-conductivity?Discuss a simple model of photo conductor.Show that sensitive photo-conductors should have long response time.

(b)Write a short note on photovoltaic cells.

Q7(a)What is superconductivity?Give salients features of superconductivity and uses of superconductors.

(b)Describe london theory of superconductivity.

Q8)Write notes on any two:

(a)Classical theory of ferromagnetism,

(b)Effective mass,

(c)Hall Effect.