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B.E / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2011
GEOINFORMATICS ENGINEERING BRANCH
SECOND SEMESTER
PH182 – PHYSICS FOR GEOINFORMATICS
(REGULATIONS 2004)



Time: 3 hr

Max Mark: 100

Answer ALL Questions

PART - A (10 × 2 = 20 Mark)

1. Define Magnetoresistance.
2. What is Meissner effect?
3. Give two importances of Doppler effects.
4. What is meant by luminescence?
5. What are lens defects?
6. Distinguish between fast and slow speed of photographic films.
7. Why does GaAs diode emit light?
8. What is the physical meaning of *hole*?
9. Define electronic polarization.
10. What do you mean dielectric loss?

PART B (5 × 16 = 80 Mark)

11. Describe the fundamentals of electromagnetic radiation sources.
12. a) Derive the expression for minimization of spherical aberration. Calculate the ratio of the radii of the lens whose refractive index is 1.5.
or
b) Explain with neat diagram the working principle of photographic film and describe the various types of photographic films. (P. T. O)

13 a) On the basis of free electron theory, derive an expression for the electrical and thermal conductivity in a metal and arrive at Wiedemann – Franz Law.

or

b) Consider the electron gas in two dimensions: Derive density of states for 2-D electron gas and show that the average electron energy density at 0 K

is $\frac{E_F}{2}$.

14 a) Obtain the expression for the intrinsic carrier concentration and arrive at the mass action law.

or

b) Obtain the quadratic equation for the Fermi level in N-type semiconductors. Solve it for low temperature range and hence show that the density of electrons in the conduction band is proportional to the square root of the donor concentration.

15 a) Describe the physics concepts involved in different types of polarizations.

or

b) Explain the domain theory of ferromagnetism. Using that how will you explain the properties of ferromagnetic materials?