Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 40065

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Computer Science and Engineering

PH 8252 – PHYSICS FOR INFORMATION SCIENCE

(Common to Information Technology)

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. How does the classical free electron theory lead to Ohm's law ?
2. Explain the concept of hole in semiconductors.
3. Distinguish between direct and indirect band in semiconductor.
4. You are given a piece of extrinsic semiconductor. How will you find to which type it belongs ?
5. Derive the relation between magnetic susceptibility and relative permeability.
6. Which material would you use for the hard drive and for a power generator ?
7. Discuss absorption of light by semiconductors.
8. What are the optical properties ?
9. What do you understand by quantum confinement ?
10. What are the Nanodevices ?

PART – B (5×16=80 Marks)

11. a) Deduce a mathematical expression for electrical conductivity of a conducting material and hence obtain Wiedemann-Franz Law. (10+6)

(OR)

b) What is density states ? Derive an expression for the density of states. (2+14)

12. a) Derive an expression for the carrier concentration in N-type and P-type semiconductors. **(8+8)**

(OR)

b) Explain with a sketch the variation of Fermi level with temperature and concentration impurities in P and N type semiconductors. **(8+8)**

13. a) Compare and contrast the different types of magnetic materials and mention their properties and applications. **(16)**

(OR)

b) Explain the domain theory of ferromagnetism. Using that how will you explain the properties of ferromagnetic materials. **(16)**

14. a) Explain the theory and working of LED. What are the advantages of using LED in electronic display ? **(16)**

(OR)

b) What is a solar cell ? Discuss in detail the construction and working of solar cell. Mention the applications of solar cell. **(16)**

15. a) Explain an experimental method used to measure the Hall coefficient of a specimen. Discuss in the principle and working of magnetic hard disk. **(8+8)**

(OR)

b) Draw energy band diagram for the p-n junction diode. Discuss in detail the operation and applications of single electron transistor. **(6+10)**