

# CBSE Question Paper - 2010

## APPLIED PHYSICS (Theory)

### Class – XII

Time allowed: 3 hours

Maximum Marks: 60

1. (a) State Gauss' theorem in electrostatics. Apply it to find the electric field strength at a point near a long straight conductor carrying electric charge.

6

OR

What is the magnitude of a point electric charge chosen so that the electric field due to it at a point 50 cm away has magnitude  $2.0 \text{ NC}^{-1}$  ?

6

- (b) Derive a mathematical expression for the magnetic field strength at the center of a circular coil carrying electric current.

5

- (c) Draw the electronic configuration in the atomic structures of 'Ge' and 'Si' atoms . How can these be made 'P-type' and 'N- type' semi – conductors?

4

2. (a) Define the terms : 'magnetic field strength' , 'magnetic flux density' and 'permeability' of a magnetic material. Write their SI units.

5

---

Other Educational Websites:

<http://studentsuvidha.in/>

and <http://studentsuvidha.in/forum>

OR

A current carrying conductor is placed at an angle of  $30^\circ$  to a uniform Magnetic field of strength  $2 \times 10^3$  T. The length of the conductor inside the Magnetic field is 2 m and the current flowing through it is 1.6 A. Calculate the Magnitude of the force experienced by it.

5

- (b) Distinguish between 'nuclear fission' and 'nuclear fusion'. Which one of them is Used for release of energy in a nuclear reactor? Name one fuel used in a nuclear reactor.

6

- (c) With the help of a circuit diagram, explain the working of a P-N-P transistor.

4

3. (a) Define the term 'capacitance' of a capacitor. Derive an expression for the total Capacitance of 'n' capacitors arranged in series.

5

- (b) Define the term 'capacitance' of a capacitor. Derive an expression for the total Capacitance of 'n' capacitors arranged in series.

6

- (c) What are intrinsic and extrinsic semi – conductors? How does the rise in Temperature affects the conductivity of semi-conductors?

4

OR

What is a P-N junction ? How does it behave under forward and reverse bias ? Explain with the help of circuit diagrams.

4

4. (a) Define electric potential at a point due to a point charge. Write its SI unit. Derive an expression for the electric potential at a point outside a charged sphere.

---

Other Educational Websites:

<http://studentsuvidha.in/>

and

<http://studentsuvidha.in/forum>

- (b) What are radiation hazards? Mention four safety measures which should be Taken against radioactive radiation.

5

6

**OR**

What are radio isotopes? Write their any four uses.

6

- (c) Explain the working of a full wave rectifier using semi – conductor diodes, with the help of a labeled circuit diagram.

4