DELHI PUBLIC SCHOOL,JAMMU

ASSIGNMENT

CLASS XII

SUBJECT PHYSICS

1.The surfaces of sunglasses are curved, yet their power may be zero. Why?

2.What is the basic use of capacitor?

3.The current i flows in a wire of circular cross section with the free electrons traveling with a drift velocity v. What is the drift velocity of electrons when a current of 2i flows in another wire of twice the radius and of the same material?

4.What is the value of conductivity of a semiconductor at absolute zero

5.A spherical conductor of radius 12 cm has a charge of 1.6×10^{-7}C distributed uniformly on its surface. What is the electric field inside the sphere?

6. A radioactive material has a half life of 1 minute. If one of the nuclei decays now, when will the next one decay?

7. A silver wire has a resistance of 2.1 Ω at 27.5 °C, and a resistance of 2.7 Ω at 100°C.Determine the temperature coefficient of resistivity of silver. Ans. A point charge of 2.0 μC is at the centre of a cubic Gaussian surface 9.0 cm on edge.

What is the net electric flux through the surface?

8. A closed loop is held stationary in the magnetic field between the north and south poles of two permanent magnets held fixed. Can we hope to generate current in the loop by using very strong magnets?

9. A nucleus with mass number A = 240 and BE/A = 7.6 MeV breaks into two fragments, each of A = 120 with BE/A = 8.5 MeV. Calculate the released energy.

10. A spherical conductor of radius 12 cm has a charge of 1.6×10^{-7}C distributed uniformly on its surface. What is the electric field inside the sphere?

11. (a) What is meant by energy density of a parallel plate capacitor? Derive its expression also.

(b) What is the area of the plates of a 2 Farad parallel plate air capacitor, given that the separation between the plates is 0.5 cm?

12. (a) For the given carbon resistor, let the first strip be yellow, second strip be red, third strip be orange and forth be gold. What is its resistance?

13. State Ampere's circuital law. Also find the expression for the magnetic field due to the infinite long straight wire carrying current by using this law.

14. Light falls from glass (n = 1.5) to air. Find the angle of incidence from which the angle of deviation is 90^0?

15. Derive an expression for the electric field intensity due to two thin infinite parallel sheets of charge.

16. (a) Define current density and conductance.
(b)Derive the relation between current density, conductance and electric field.

17.A common emitter amplifier is designed with npn transistor (a = 0.99). The input impedance is 1 kW and load is 10 kW. Find the voltage gain and power gain.

18. (a) What do you mean by modulation and demodulation? Explain.

(b) (b) An audio signal of amplitude 0.1 V is used in amplitude modulation of a carrier wave of amplitude 0.2 V. Calculate the modulation index.

19 (a) Using Gauss law, derive an expression for the electric field intensity at any point outside a uniformly charged thin spherical shell of radius R and charge density $\sigma C/m^2$. Draw the field lines when the charge density of the sphere is positive and negative.

20 A uniformly charged conducting sphere of 2.5 m in diameter has a surface charge density of $100\mu C/m^2$. Calculate the

(i) Charge on the sphere

(ii)Total electric flux passing through the sphere

21.A parallel plate capacitor with air between the plates has a capacitance of 8 pF (1pF = 10^{-12}F). What will be the capacitance if the distance between the plates is reduced by half, and the space between them is filled with a substance of dielectric constant 6?