CLASS XII
SAMPLE PAPER
PHYSICS

ASHISH TUTORIALS
PHYSICS (NCERT- 1st PART)

TIME: 2:00 Hr   MM: 63

1.   A proton is placed in a uniform electric field along the positive X- axis. In which direction will it tend to move?   (1)

2.   Sketch the pattern of electric field lines due to (i) a conducting sphere having negative charge on it and (ii) An electric dipole.   (1)

3.   Why does the electric field inside a dielectric decreases, when it is placed in an external electric field?   (1)

4.   Magnetic field lines can be entirely confined within the core of a toroid , but not within a straight solenoid. Why?   (1)

5.   Out of an ammeter and voltmeter, which of the two has higher resistance and why?   (1)

6.   The suspectibility of a magnetic material is 1.91×10^{-5} . Name the type of material it represents.   (1)

7.   Why do we use steel or alnico for making permanent magnets.   (1)

8.   Two identical loops, one of copper and another of aluminium are rotated with the same speed in the same magnetic field. In which case, the
        (a) induced e.m.f. and (b) induced current will be more and why?   (1)

9.   What is wattless current?   (1)

10.   Explain briefly with the help of a labelled diagram, the basic principle of the working of an a.c. generator.   (3)

11.   In the given diagram, an electric lamp having coil of negligible inductance connected in series with a capacitor and an a.c. source is glowing with a certain brightness. How does the brightness of the lamp change on reducing (i)the capacitance and (ii) the frequency? Justify your answer.   (3)

12.   With the help of a labelled diagram, describe briefly the underlying principle and working of a step-up transformer.   (3)

13.   Identify the type of the electromagnetic waves, whose method of propagation is associated with (a) a klystron valve, (b)vibration of atoms and molecules and (c) decay of atomic nuclei. Also give the approximate range of wavelength of each of the waves.   (3)

14. An element $\Delta l = \Delta x$ i is placed at the origin
    and carries a current I = 2 A as shown in fig.
    Find the magnetic field at a point P on Y- axis
    at a distance 1 m due to the element $\Delta x = 1m$.
    Give also the direction of the field produced.   (3)

15. Using Kirchhoff's laws, derive the condition for balance of a Wheatstone
    Bridge circuit?   (3)

16. Three cells of e.m.f. E, 2E and 5E having
    internal resistances r, 2r and 5r respectively
    are connected across a variable resistance as
    shown in fig. Find the expression for the current.
    Plot a graph for the variation of current with R.   (3)

17. Two conductors X and Y of same diameter but of different metals are joined
    in series across a battery. If the number density of electrons in X is twice that
    in Y / Find the ratio of drift velocity of electron in two metals.   (3)

18. A point charge Q is placed at a point O as shown
    Is the p.d. VA-VB is positive, negative or zero,
     if Q is (i) positive (ii) Negative   (3)

19. A parallel plate capacitor of capacity C is charged to a p.d. of V and then the
    battery is disconnected. Now a dielectric slab of dimensions equal to spacing
    between the plates of the capacitor is inserted between the plates. What are
    the changes, If any, in the capacitance, charge, p.d., electric field and the
     stored energy.   (3)

20. Two point charges +5µC and – 5µC are placed at a distance 5 cm apart. (i)
    Draw the equipotential surface of the system (ii) Why do the equipotential
    surfaces closer to each other near the point charge?   (3)

21. Two circular coils, one of radius r and the other of radius R are placed
    coaxially with their centres coinciding. For R≫r, obtain an expression for
    the mutual inductance of the arrangement.   (3)

22. The electric field E due to a point charge at any point near it is defined as
    Lt (F / qo),where qo is a test charge and F is the force acting on it. What is
    the physical significance of Lt in this expression.   (3)

23. State Gauss' theorem. Show by using suitable example, that this theorem is
    based on Coulomb's inverse square law.   (3)

24. Deduce an expression for the electric field E due to a system of two charges
    q1 and q2 with position vectors r1 and r2 at a point 'r' w.r.t. the common
    origin O.   (5)

25. State Biot- Savart law, giving the mathematical expression for it. Use this law
    to derive the expression for the magnetic field due to circular coil carrying
    current at a point along its axis. How does a circular loop carrying current

behave as a magnet? (5)

26. With the help of the diagram, explain the principle and working of a moving coil galvanometer. What is the importance of a radial magnetic field and how is it produced .Why is that while using a a moving coil galvanometer as voltmeter, a hogh resistance in series is required, where as in an ammeter, a shunt is used? (5)

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