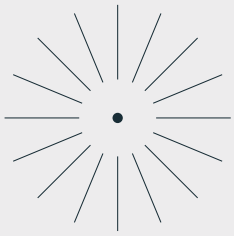
Karnataka Board

Mid Term Question Paper



2nd PUC
Question Paper

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PUC-II YEAR MIDTERM EXAMINATION-2022

Time : 3 Hours 15 Minutes | SUBJECT : PHYSICS (33) | MARKS : 70

Instructions : 1) All parts are compulsory.
2) Answer without relevant diagram/ figure/ circuit wherever necessary will not carry any marks.
3) Direct answers to the Numerical problems without detailed solutions will not carry any marks.

PART-A

10X1=10

I. Answer the following questions :

1) Can two electric field lines intersect ?
2) Define electric field.
3) What is value of electric potential at a point on the equatorial line of an electric dipole ?
4) Mention the S.I unit of mobility.
5) The colour code of a carbon resistor is brown red brown gold. What is the value of resistance ?
6) How does the resistivity of metallic conductor vary with temperature ?
7) What is the path of charged particle moving along the uniform magnetic field ?
8) What is a Cyclotron ?
9) Define current sensitivity of galvanometer.
10) What is curie temperature ?

PART-B

5X2=10

II. Answer ANY FIVE of the following questions.

11) Explain electrostatic shielding.
12) Write the Coulomb's law in vector form. Explain the terms.
13) Give any two limitations of ohm's law.
14) State Kirchhoff's rules.
15) When will the magnetic force on a moving charge be ?
    i) maximum and ii) minimum
16) State and explain Ampere's circuital law.
17) The vertical component of earth's magnetic field at a place is $\sqrt{3}$ times its horizontal component. Find the dip at that place.
18) State Lenz's law of EMI is in accordance with the law of conservation of energy.

PART-C

5X3=15

III. Answer ANY FIVE of the following questions.

19) Obtain an expression for torque acting on an electric dipole placed in a uniform electric field.
20) Derive an expression for effective capacitance of two capacitors connected in series.
21) Define : i) emf
    ii) internal resistance and
    iii) terminal potential difference of a cell
22) Derive an expression for drift velocity of free electrons in a conductor.
23) Draw Wheatstone's bridge circuit and write the condition for its balance.
24) Explain with circuit diagram how to convert galvanometer in to voltmeter.
25) Mention any three properties of magnetic field lines.
26) Draw hysteresis curve and indicate retentivity and coercivity in the diagram.

(P.T.O)

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PART-D

IV. Answer ANY TWO of the following questions : **2X5=10**

27) Derive an expression for electric field due to an electric dipole at a point on the axial line.

28) Define electric potential due to point charge and arrive at an expression for electric potential due to an isolated point charge.

29) What is equivalent resistance ? Derive an expression for equivalent resistance of two resistors are in parallel.

V. Answer ANY TWO of the following questions. **2X5=10**

30) Derive the expression for the force experienced by a current carrying conductor placed in uniform magnetic field.

31) Mention any five properties of paramagnetic materials.

32) Explain briefly the coil-magnet experiment to demonstrate the phenomenon of electro-magnetic induction.

PART-E

VI. Answer ANY THREE of the following questions. **3X5=15**

33) Charges of -2×10^{-10}c, $+2\times10^{-10}$c and $+4\times10^{-10}$c are placed at the corners A, B and D of a square of side 2m. Calculate the resultant field at the centre of the square.

34) Two capacitors of capacitance 300 PF and 600PF are connected in series across 200V supply. Calculate

i) The effective capacitance of the combination

ii) The p.d across each capacitor and

iii) the total charge stored in the system

35) Three 4V batteries with internal resistances 0.1Ω, 0.2Ω and 0.3Ω are connected in parallel. This combination is connected across 2Ω resistor. Calculate

i) equivalent internal resistance and equivalent emf.

ii) the current through the external resistance

iii) the terminal pd across each cell.

36) Two wires which connect the battery of an automobile to the starting motor carry a current of 3A. Calculate

a) the force and

b) force per unit length between the wires if they are 70 cm long and 1.5 cm apart ? Is the force attractive or repulsive ?

$\mu_0=4\pi\times10^{-7}$m/A

37) A Sinusoidal current is represented by the equation I=2sin (100πt) A. Calculate

a) period

b) rms value

c) current at t=$\frac{T}{16}$ sec and

d) time required by the current to change its value from zero to the rms value.

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