EXCEL EDUCATION
9211204675, 27384621

PHYSICS XII
Magnetic effect of Current & Magnetism

MM = 20
Time = 45 min

Q.1 A proton and an α-particle enter a uniform $\vec{B}$ normally with equal momentum. Find the ratio of radii and time periods of their trajectory. (1)

Q.2 What is magnetic moment of an electron in a circular orbit of radius r, moving with speed v. (1)

Q.3. Define angle of dip and magnetic declination with the help of suitable diagram. What is angle of dip at magnetic equator? (1)

Q.4 What type of magnetic field is applied to a current carrying coil in galvanometer. Why? (1)

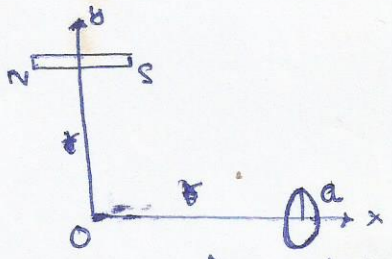
Q.5. Write two differences between $\vec{E}$ and $\vec{B}$ lines. (1)

Q.6. Derive expression for $\vec{B}$ on the axis of a circular coil of radius R carrying current I. Identify magnetic moment of this coil. (3)

Q.7 A galvanometer coil of 50 Ω shows full scale deflection for a current of 5 mA. How will you convert this galvanometer into a voltmeter of range 0 to 15 V? (2)

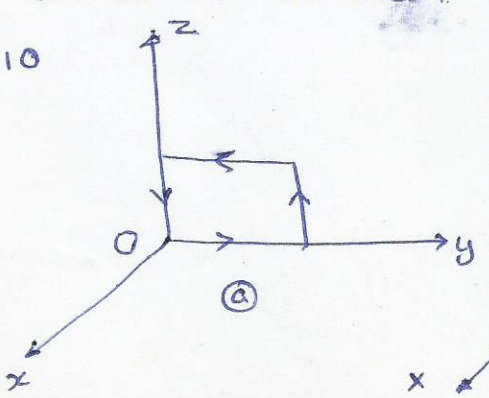
Q.8 A long straight wire of circular cross-section of radius 'a' carries a steady current I, distributed across the cross-section. Apply Ampere's circuital law to calculate $\vec{B}$ at a distance 'r' from. (2)
Curve for (i) $r < a$ (ii) $r > a$

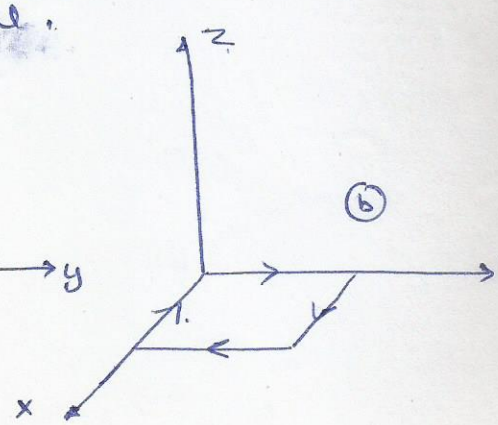
Q.9.



A small magnet of moment M is placed at a distance r from the origin O with its axis parallel to x-axis. A small coil of one turn and radius a is placed at same distance on x-axis with axis same as x-axis. For what value of current in the coil a small magnetic needle kept at origin remains undeflected. What is direction of current in the coil. (2)

Q.10





A rectangular coil of area A carries current I is placed in $\vec{B} = B\hat{k}$. Find the torque experienced by this coil in two orientations (a) & (b). (2)

Q.11 A magnetic dipole is placed in uniform $\vec{B}$. Deduce expression for Time period of its oscillations. How will time period vary if a Bar magnet is replaced by a combination of two similar bar magnets placed over each other with axis parallel. (4)