1. What will you notice when a current is allowed to pass through a soft solenoid and why?
(1)
2. What do you mean by non ohmic resistance? Name a material or a device which offers non ohmic resistance.
(1)
3. A cylindrical wire is stretched to increase its length by $10 \%$. Calculate the percentage of change in resistance.
4. Two small identical circular loops of radius R marked $1 \& 2$ carrying currents I and 2I respectively are placed with the geometrical axes perpendicular to each other as shown in the figure. Find the magnitude of the net magnetic field produced at the point ' O '.

5. Two resistors of resistances $100 \Omega$ and $200 \Omega$ are connected in series and the combination is connected across a source emf 84 V with negligible resistance. A voltmeter of resistance $400 \Omega$ is connected across $100 \Omega$ resistor. What will be the reading on the voltmeter?
6. A circular coil of 30 turns and radius 8.0 cm carrying current of 6.0 A is suspended vertically in a uniform magnetic field of 2.0 T . The field lines make an angle of $60^{\circ}$ with the plane of the coil. Calculate magnitude of torque that must be applied to prevent the coil from turning.
7. Derive the expression for current flowing through a conductor using the expression of drift velocity.
8. A proton and an alpha particle enter normally in a uniform magnetic field. Calculate the ratio of radii of their trajectories, if they enter with same kinetic energy.
9. State the principle of a potentiometer. Explain how you will determine internal resistance of a primary cell hence; derive the relation for internal resistance.
10. Draw a schematic diagram of cyclotron. Explain clearly the function of the electric and magnetic fields applied on a charged particle. Deduce an expression to show that radius of its trajectory increases with speed of the charged particle.

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\begin{equation*}
-X-X-X-X-X-X- \tag{3}
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