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Home Assignment

1. i) Cyclotron is used to accelerate :-

ans ⇒ Some kind of charged particle

ii) The force that accelerates the particles in the cyclotron is :-

ans ⇒ Only electrostatic force.

iii) Choose the correct option :-

ans ⇒ a) Conductor shields any charge within it from electric fields created outside the conductor.

iv) Inside a dee :

ans ⇒ b) The particle's velocity changes.

v) What is the formula for maximum speed attained by a charged particle in a cyclotron :-

ans ⇒ $V_{MAX} = \frac{qBR}{M}$.

vi) In a cyclotron :

ans ⇒ Maximum speed attained by a charge particles is limited by the relativistic variation of mass with speed.

2. i) Galvanometer was named after :-

ans ⇒ a) Italian electricity researcher Luigi Galvani

ii) Galvanometer is used :-

ans ⇒ a) detect and measure small electric current.

iii) Choose the correct option for current sensitivity of galvanometer.

ans ⇒ a) $S_i = \frac{\theta}{i} = \frac{NBA}{C}$

iv) Increasing the current sensitivity

ans ⇒ b) may not change the voltage sensitivity

v) Choose the correct option for design formula of galvanometer.

ans ⇒ $i = \left(\frac{C}{BNA}\right)\theta$

vi) In the galvanometer the radical magnetic field makes the magnetic torque.

ans ⇒ a) directly proportional to sin θ

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3. 1. a) both assertion and reason are true and the reason is the correct explanation of the assertion.

⇒ Here, a steady angular deflection is produced by the spring to produce a torque because when a cylindrical soft iron core is placed inside the coil it increases the strength of the magnetic field and when current flows through the coil, a torque acts on it.

2) a) both assertion and reason are true and the reason is the correct explanation of the assertion.

⇒ Phosphor - Bronze wire is used for suspention in a moving coil galvanometer because it has small restoring torque per unit twist and high tensile strength.

3) a) both assertion and reason are correct and the reason is the correct explanation of the assertion.

⇒ Every current element on the irregular shaped wire having symmetric elements carrying current in opposite direction is causing repulsion and hence the area enclosed by the wire increases.

4. d) Both assertion and reason are false.

⇒ In a non-uniform magnetic field both a torque and a net force act on the dipole.
If magnetic field were uniform net force on dipole would be zero.

5. b) both assertion and reason are true but the reason is not the correct explanation of assertion.

⇒ If the shunt resistance is increased, lesser current will pass through it as it is connected in parallel.

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And greater current will pass through the ammeter. Lower the resistance of an ammeter gives the higher range.

6. a) both assertion and reason are true and reason is the correct explanation of assertion.

⇒ Galvanometer is a very sensitive device, it gives full-scale deflection for current in order of micro-ampere. so inorder to measure the value of the current (higher current) a small ~~resistance~~ resistance called shunt resistance is ~~attached~~ attached in parallel with galvanometer coil. to convert it into an ~~ammeter~~ ammeter.

4. (1) a) a voltmeter connected in parallel and current through it is negligible.

2) c) Infinity.

3) a) more.

4) a) $i = \left(\frac{C}{BNA}\right)\theta$

5) a) $S_i = \frac{\theta}{i} = \frac{NBA}{C}$