

i) a) Some kind of charged particles

because it only accelerate +vely charged particles because electrons can't be accelerated due to increase in their energy their velocity increases to a very large extent & neutron being electrically neutral, can't be accelerated.

ii) c) Both electrostatic & magnetic force called Lorentz force.

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

iv) d) The particle's kinetic energy changes.

$$v) a) V_{max} = \frac{qBR}{m}$$

Thus, the Lorentz force provides the necessary centripetal force.

$$mv^2/r = qvB$$

$$v = qBr/m$$

The max velocity of charged particle is acquired when it moves in an orbit of greatest radius.

$$\text{So, } V_{max} = qBr/m.$$

vi) b) Maximum speed attained by a charged particle is limited by the relativistic variation of mass with speed.

Variation balances the relativistic mass increase, resulted in static magnetic field & accelerated by a rapidly varying electric field. So, the max amount of speed attained are limited because of variation in balancing the relativistic variation of mass with speed.

2) i) Italian electricity researcher Luigi Galvani.

ii) to detect & measure small electric current.

A galvanometer works by deflecting a pointer in response to an electric current flowing through a coil in a constant magnetic field. Point of deflection is min in galvanometer. So, it measures small amount of current.

$$iii) S_i = \frac{Q}{i} = \frac{NBA}{C}$$

iv) never changes the voltage sensitivity.

Voltage sensitivity decreases with increase in resistance of the coil, the effect of increase in no. of turns is nullified in the case of voltage sensitivity. Hence, there is no increase in voltage sensitivity.

v) none of these.

vi) zero

With the help of radial magnetic field, the angle betⁿ the plane of the coil & the magnetic field is maintained 0 in all the orientation of the coil. So, $\sin 0 = 0$.

3) i) a) Both assertion & reason are true & the reason is the correct explanation of the assertion.

ii) a) Both assertion & reason are true & reason is the correct explanation of the assertion.

Every current element $d\ell$ on the irregular shape wire having symmetric element carrying current in opp. directⁿ is causing repulsion & hence the area enclosed by the wire increases.

iii) d) Both assertion & reason are false.

iv) b) Both assertion & reason are true but reason is not a correct explanation of the assertion.

v) a) Both assertion & reason are true but & reason is the correct explanation of the assertion.

Galvanometer is a very sensitive device, gives a full scale deflection for current of the order of micro ampere. Also for measuring current, the galvanometer has to be connected in

series & as it has a large resistance. This will change the value of the current in the circuit. To overcome these difficulties, a small resistance is attached, in parallel with it.

i) ii) an ammeter is connected in series in a circuit & the current through it is negligible.

A galvanometer can be converted into a voltmeter by connecting a high resistance in series with it, while it can be converted into ammeter by connecting a low resistance in its parallel.

Ammeter is always connected in series & current through it is max.

ii) c) infinity

A voltmeter is always used in parallel in circuit to get an accurate value of voltage across some element, the resistance of voltmeter is kept very high so that it can draw min amount of current from circuit & hence can measure accurate voltage.

iii) d) more

Greater the shunt, smaller the range of ammeter. The shunt is connect in parallel with the galvanometer. The shunt of greater resistance will draw less current passing through coil of galvanometer will be more.

iv) d) none of these

$$v) a) S_i = \frac{Q}{i} = \frac{NBA}{c}$$