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MAGNETISM

1.A unit of magnetic induction is:

(a) weber/meter²

(b)weber/ampere –meter

(c) weber/meter

(d) weber

2.An electric charge q moves with a constant velocity V parallel to the lines of force of a uniform magnetic field B. The force experienced by the charges:

(a)Bqv (b)B/qv (c)Bq/v (d)zero

3.An electron is injected into a uniform magnetic field with components of velocity parallel to and normal to the field direction .The path of the electron is a:

(a)helix (b)circle

(c)Parabola (d)Straight Line

4.An electron is moving in a circle of radius r in a uniform magnetic field B. Suddenly the field is reduced to B/2 .The radius of the circle now becomes :

(a)r/2 (b)r/4 (c)2r (d)4r

5.Protons and α –particle of equal momenta enter a uniform magnetic field normally .The radii of their orbits will have the ratio :

(a)1 (b)2 (c)0.5 (d)4

6.A proton and a-particle moving with the same Kinetic energy ,enter a uniform magnetic field normally .The radii of their circular paths will be in the ratio

(a)1:1 (b)2:1 (c)1:2 (d)4:1

7.A proton and a-particle,

accelerated through the same potential difference ,enter a region of uniform magnetic field normally .If the radius of the proton orbit is 10cm ,that of the a-orbit is:

(a)10cm (b)$10\sqrt{2}$cm

(c)20cm (d)$5\sqrt{2}$cm

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8.A 0.5 m wire, stretched horizontally carries a current of 10 A from east to west in a magnetic field of 0.1 T directed vertically downwards .The magnitude and direction of the force on the wire are

(a)0.5 N towards south

(b)0.5 N towards north

(c)0.25 towards south

(d)0.25 towards north

9.A conducting circular loop of radius r carries a constant current I .It is placed in a uniform magnetic field B such that B is perpendicular to the plane of the loop. The magnetic force acting on the loop is

(a)riB (b)2πriB (c)zero (d)πriB

10.A proton is moving in a circular orbit in a magnetic field with energy 1 MeV. The energy of an a-particle which resolve in the same field in an orbit of the same radius is

(a)0.5 MeV (b)1MeV

(c)2MeV (d)4 MeV

11.An electron describes a circular orbit of radius 2 cm in a uniform magnetic field .If the speed of the electron is doubled ,then the radius of the orbit will become

(a)0.5cm (b)1.0cm
(c)2.0cm (d)4.0cm

12.A deuteron of Kinetic energy 50 KeV describes a circular orbit in a magnetic field .The Kinetic energy of a proton that describes a circular orbit of the same radius in the same field would be

(a)25 Ke V (b)50 Ke V

(c)100 Ke V (d)200 Ke V

13.An electric current is flowing in along straight wire .The magnetic field due to this current at a distance of 5cm from the wire is :

(a)2.5 gauss (b)5 gauss

(c)20 gauss (d)40 gauss

14. The current sensitivity of a moving coil galvanometer depends on

(a)The numbers of turns in the coil

(b)moment of inertia of the coil

(c)strength of the electric field

(d)None of these

15.In order to increase the current sensitivity of a moving coil galvanometer the

(a)number of turns of the coil should be increases

(b)strength of the magnetic field should be increased

(c)area of the coil should be increased

(d)All of the above

16.If we double the radius of a coil keeping the current through it unchanged ,then the magnetic field at any point at a large distance from the centre becomes approximately :

(a)double (b)three times

(c)four times (d)one-forth

17.A current carrying circular coil is bent so as to convert into a double loop ,both the loops being concentric and carrying current in the same direction .If B is the initial magnetic field at the centre, the final magnetic field at the centre will be

(a)zero (b)B (c)2 B (d)4 B

18.An electron and a proton enter a magnetic field at right angles to the field with the same Kinetic energy

(a)The trajectory of the electron

(b)The Trajectory of the proton

(c)Both the trajectory will be equally curved

(d)Both will move along straight be line paths

19.The radius of the orbit of a charged particle in a magnetic field is proportional to the :

(a)strength of the magnetic field

(b)Kinetic energy

(c)momentum of the particle

(d)charge of the particle

20. Force between two long straight parallel current carrying wire is F .If the current in one of them is doubled ,the force between them will be :

(a)2F (b)$\sqrt{2}F$ (c)$2\sqrt{2}F$ (d)4F

21.A long solenoid has 20 turns/cm ,the current necessary to produce a magnetic field of 20 millitesla inside the solenoid is approximately

(a)1A (b)2A (c)4A (d)8A

22.A current of 10A is flowing is a wire of length 1.5 m. A force of 15 N acts on it when it is placed in a uniform magnetic field of 2 T. The angle between the magnetic field and the direction of the current is:

(a)30 (b)45 (c)60 (d)90

23. A current of 1 A is flowing in the sides of an equilateral triangle of side 4.5 X 10^{-2} m.The magnetic field at the centroid of the triangle is :

(a)2 x 10^{-5} T (b)4 X 10^{-5} T

(c)8 x 10^{-5} T (d)1.2 X 10^{-4} T

24.A strong magnetic field is applied on a stationary electron .Then the electron

(a)moves in the direction of the field

(b)moves opposite to the field

(c)starts spinning

(d)remains stationary

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25. The S.I unit of magnetic permeability is

(a)$Wbm^{-2}A^{-1}$

(b) $Wbm^{-1}A^{-1}$

(c) $Wbm^{-1}A$

(d) WbA^{-1}

26.The path executed by a charged Particle whose motion is perpendicular to magnetic field is

(a)straight line (b) circular

(c)elliptic (d)parabolic

27. Magnetic field inside a solenoid is

(a)directly proportional to current

(b)inversely proportional to current

(c)directly proportional to its length

(d)inversely proportional to the total number of turns

28. The field due to a long straight wire, carrying a current I is proportional to

(a)I (b)I^{-1} (c)$\sqrt{I}$ (d)I^3

29.Magnetic effect of current was discovered by :

(a)Faraday (b)Oersted

(c)Kirchhoff (d)Joule

30.The unit of magnetic flux is:

(a)weber (b)weber/m²

(c)henry (d)ampere/m