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Magnetism

1.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 of the particle
(c)momentum of the particle
(d)charge of the particle

2.Force between two long straight parallel current carrying wires is F. If the current in one of them is doubled, the force between them will be
(a)2F   (b$\sqrt{2F}$ (c)$2\sqrt{2F}$ (d)4F

3.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   (b)4A   (d)8 A

4.A current of 10 A 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°

5.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

6.A strong magnetic field is applied on a stationary electron .Then the electron
(a)moves in the direction of the field
(b)moves in the opposite of the field
(c)starts spinning
(d)remains stationary

7.The S.I unit of magnetic field permeability is
(a)Wb$m^{-2}A^{-1}$ (b)Wb$m^{-1}A^{-1}$
(c)Wbm^{-1}A   (d)WbA^{-1}

8.A moving charged is subjected to an external magnetic field .The change in the Kinetic energy of the particle
(a)increase with the increase in the field strength
(b)decrease with increase in the field strength
(c)is always zero

(d)depends upon whether the field is uniform or non-uniform

9.The path executed by a charged particle whose motion is perpendicular to a magnetic field is
(a)straight line
(b)inversely proportional to current
(c)directly proportional to its length
(d)inversely proportional to the total number of turns

10. 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

11. To make the field radial in a moving coil galvanometer
(a)the number of turn in the coil is increased
(b)magnet is taken in the form of horseshoe
(c)poles are cylindrical cut
(d)coil is wound on aluminum frame

12. The magnetic field B(in tesla)with in a long solenoid having in turns per meter and carrying a current of I ampere is given by
(a)$\mu_0 ni/4\pi$ (b)$\mu_0 ni$ (c)$4\pi\mu_0 ni$ (d)ni

13.A positively charged particle enters a uniform magnetic field with a constant velocity at angle with the field which is different from 0° to 90°.The path of the particle in the field will be
(a)circular   (b)helical
(c)parabola   (d)straight line

14.A proton and an a-particle enters magnetic field perpendicularly ,with the same speed .If the proton takes 25 microseconds to make 5 revolutions, the periodic time for the a-particle would be
(a)50 μs   (b)25μs   (c)10μs   (d)5μs

15. Magnetic effect of current was discovered by
(a)Faraday   (b)Oersted
(c)Kirchhoff   (d)joule

16. The unit of magnetic flux is
(a)weber   (b)weber/m^2
(c)henry   (d)ampere/m

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17.A straight wire of diameter 0.5 mm carrying a current of 1 A is replaced by another wire of diameter 1 mm carrying same current .The strength of the magnetic field far away is
(a)twice the earlier value
(b)half the earlier value
(c)quarter of the earlier value
(d)not changed

18.A positively charged particle moving due east enters a region of uniform magnetic field directed vertically upwards. This particle will
(a)get deflected vertically upwards
(b)move in a circular orbit with increased speed
(c)move in circular orbit with unchanged speed
(d)move in the same direction with the same speed

19. The magnetic field lines in the middle of a solenoid are
(a)circles   (b)parallel to the axis
(c)spirals   (d)perpendicular to the axis

20. Two electrons beams are travelling parallel to each other .They
(a)attract each other   (b)repel each other
(c)do not affect each other   (d)will turn perpendicular to each other

21.A cyclotron accelerates a beam of proton to 24 MeV.The same cyclotron will accelerates a deuteron beam to
(a)6 MeV   (b)12MeV   (c)24MeV   (d)48MeV

22.A particle is moving in a uniform magnetic field
(a)Its momentum changes but total energy remains the same
(b)Both momentum and total energy remain the same
(c)Both momentum and total energy change
(d)Total energy changes but momentum remains the same

23. If a current is passed in a spring ,it
(a)gets compressed   (b)gets expanded
(c)oscillates   (d)remains unchanged

24. Magnetic field due to an infinite current carrying wire varies with the distance (r)from the wire as
(a)r   (b)r^2 (c)1/r   (d)1/r²

25. The magnetic induction associated with current flowing in a hollow copper tube will be
(a)only inside   (b)only outside
(c)both inside and outside
(d)neither inside nor outside

26. In a current –carrying long solenoid the field produced does not depend upon
(a)number of turns per unit length
(b)current flowing
(c)radius of the solenoid
(d)all of the above three

27.A long solenoid has 800 turns per meter length of solenoid .A current of 1.6 A flows through it .The magnetic induction at the end of the solenoid on its axis is
(a)16 x $10^{-4}\,T$ (b)8 x $10^{-4}\,T$
(c)32 x 10^{-4} T   (d)4 x 10^{-4} T

28.A charged particle is released from rest in a region of steady and uniform electric and magnetic fields which are parallel to each other .The particle will move in a
(a) straight line   (b)circle
(c)helix   (d)cycloid

29.A long solenoid has n turns per metre and current I A is flowing through it .The magnetic field at the ends of the solenoid is :
(a)$\frac{\mu_0 nI}{2}$ (b)$\mu_0 nI$ (c)zero   (d)$2\mu_0$nI

30. When a charged particle enters a uniform magnetic field its kinetic energy:
(a)remains constant   (b)increased
(c)decrease   (d)becomes zero