Q.1 A magnet is broken into three pieces in length. The strength of the new poles is the strength of the poles of original magnet -

(A) the same as (B) one half

(C) double (D) one third

Q.2 Magnetic field produced by electrons in atoms and molecules is due to their -

(A) spin motion only

(B) orbital motion only

(C) spin and orbital motion both

(D) neither spin nor orbital motion.

Q.3 A steel wire of length ℓ has a magnetic moment M. It is then bent into a semicircular arc. The new magnetic moment is -

(A) M (B) $2M/\pi$

(C) M/ℓ (D) $M \propto \ell$

Q.4 Two identical thin bar magnets each of length ℓ and pole strength m are placed at right angles to each other, with north pole of one touching south pole of the other, then the magnetic momenta of the system is -

(A) $1\ m\ell$ (B) $2\ m\ell$

(C) $\sqrt{2}\ m\ell$ (D) $m\ell/2$.

Q.5 Magnetic field due to a bar magnet at a distance 'r' from centre. (Angle between $\vec{r}$ and $\vec{M}$ is θ)

(A) $\frac{\mu_0}{4\pi}\frac{M\cos\theta}{r^3}$ (C) $\frac{\mu_0}{4\pi}\frac{M\sqrt{1+4\cos^2\theta}}{r^3}$

(B) $\frac{\mu_0}{4\pi}\frac{M\sin\theta}{r^3}$ (D) $\frac{\mu_0 M}{4\pi r^3}\sqrt{1+3\cos^2\theta}$

Q.6 The ratio of magnetic potentials due to magnetic dipole in the end on position to that in broadside on position for the same distance from it is -

(A) zero (B) ∞

(C) 1 (D) 2

Q.7 The magnetic potential at a point distant 10 cm from the middle point of a magnetic dipole on a line incline at an angle of 60º with the axis is 3 e.m.u. Then the magnetic moment of magnet is -

(A) 600 ab - amp cm^2

(B) 300 ab - amp cm^2

(C) 150 ab - amp cm^2

(D) 300 $\sqrt{3}$ ab - amp cm^2

Q.8 A thin bar magnet of length 2ℓ and breadth 2b pole strength p and magnetic moment M is divided into four equal pars with length and breadth of each part being half of original magnet. Then the pole strength of each part is-

(A) p (B) p/2

(C) 2p (D) p/4

Q.9 In the above question, magnetic moment of each part is -

(A) M/4 (B) M

(C) M/2 (D) 2M

Q.10 When a magnet is heated, its strength –

(A) always decreases (C) may increase or decrease

(B) always increases (D) remains unaffected

Q.11 A magnetic needle is kept in a non–uniform magnetic field. It experiences –

(A) a force and a torque

(B) a force but not a torque

(C) a torque but not a force

(D) neither a force nor a torque

Q.12 Two points A and B are situated at a distance x and 2 x respectively from the nearer pole of a magnet 2 cm long. The ratio of magnetic field at A and B is –

(A) 4 : 1 exactly

(B) 4 : 1 approximately

(C) 8 : 1 approximately

(D) 1 : 1 approximately

Q.13 The magnet of pole strength m and magnetic moment M is cut into two pieces along its axis. Its pole strength and magnetic moment now becomes –

(A) $\frac{m}{2}$, $\frac{M}{2}$ (B) m, $\frac{M}{2}$

(C) $\frac{m}{2}$, M (D) m, M

Q.14 The distance between two magnetic poles is doubled and their pole strength is also doubled. Force between them –

(A) remains unchanged (B) becomes twice

(C) becomes 8 times (D) becomes 4 times

Q.15 A large magnet is broken into two pieces so that their lengths are in the ratio 2 : 1. The pole strengths of the two pieces will have ratio -

(A) 2 : 1 (B) 1 : 2

(C) 4 : 1 (D) 1 : 1

Q.16 A circular coil of radius 4 cm having 50 turns carries a current of 2A. It is placed in uniform magnetic field of intensity of 0.1 Weber/m^2. The work done to rotate the coil from the equilibrium position by 180° is -

(A) 0.1 J (B) 0.2 J

(C) 0.4 J (D) 0.8 J

Q.17 A circular coil of radius 4 cm having 20 turns carries a current of 3 A. It is placed in a magnetic field of intensity 0.5 Weber/m^2. The potential energy of the magnetic dipole of the coil is –

(A) – 0.15 J (B) – 0.3 J

(C) – 0.45 J (D) – 0.6 J

Q.18 A magnetic dipole is placed at right angles to the direction of lines of force of magnetic induction B. If it is rotated through an angle of 180°, then the work done is -

(A) MB (B) 2 MB

(C) – 2 MB (D) Zero

Q.19 A magnetic field exerts no force on -

(A) a magnet

(B) an unmagnetised iron bar

(C) a moving charge

(D) a charge at rest

Q.20 The line joining a point to the centre of a short magnet makes angles θ with the axis. Potential at a point distant d from the centre of magnet, on this line is -

(A) $\frac{\mu_0 M \sin\theta}{4\pi d^2}$ (B) $\frac{\mu_0 M \cos\theta}{4\pi d^2}$

(C) $\frac{\mu_0 M}{4\pi d^3}$ (D) none of these

Q.21 Potential at any point on equatorial line of dipole is -

(A) $\mu_0 M/4 \pi d^2$

(B) $\mu_0 M/4 \pi d^3$

(C) zero

(D) none of these

Q.22 The value of angle of dip is zero at the magnetic equator because on it -

(A) V and H are equal

(B) the value of V and H is zero

(C) the value of V is zero

(D) the value of H is zero

Q.23 The error in measuring the current with a tangent galvanometer is minimum when the deflection is about -

(A) 0° (B) 30°

(C) 45° (D) 60°

Q.24 The needle of a dip circle when placed at a geomagnetic pole stays along -

(A) South north direction only

(B) East west direction only

(C) Vertical direction

(D) None of the above

Q.25 Earth's magnetic field always has a horizontal component except at -

(A) equator

(B) magnetic pole

(C) a latitude of 60°

(D) an inclination of 60°

Q.26 The lines of force due to earth's horizontal magnetic field are -

(A) parallel and straight

(B) concentric circle

(C) elliptical

(D) curved lines

Q.27 The vertical component of earth's magnetic field is zero at -

(A) magnetic equator (B) magnetic pole

(C) geographic poles (D) at 90° latitude

Q.28 A dip needle which is free to move in a vertical plane perpendicular to magnetic meridian will remain-

(A) horizontal (C) neither horizontal nor vertical

(B) vertical (D) nothing can be said

Q.29 The angles of dip at the poles and the equator respectively are -

(A) 30°, 60° (B) 90°, 0°

(C) 30°, 90° (D) 0°, 0°

Q.30 The angle of dip at a certain place where the horizontal and vertical components of the earth's magnetic field are equal is -

(A) 30° (B) 75°

(C) 60° (D) 45°

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	A	C	B	C	D	B	A	B	A	A
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	A	C	A	A	D	A	A	D	D	B
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	A	C	C	C	B	A	A	B	B	D