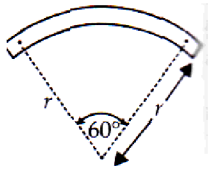
DPP – 1

Q.1 A magnetic needle lying parallel to a magnetic field requires W units of work to turn it through 60°. The torque needed to maintain the needle in this position will be

(A) $\sqrt{3}W$ (B) W

(C) $\left(\frac{\sqrt{3}}{2}\right)W$ (D) 2W

Q.2 A bar magnet of length 'l' and magnetic dipole moment 'M' is bent in the form of an arc as shown in figure. The new magnetic dipole moment will be



(A) $\frac{2}{\pi}M$ (B) $\frac{M}{2}$

(C) M (D) $\frac{3}{\pi}M$

Q.3 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 become

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

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

Q.4 The time period of a freely suspended bar magnet in a magnetic field id 2sec. it is cut into two equal parts along its axis, then the time period is

(A) 4sec (B) 0.5 sec

(C) 2 sec (D) 0.25 sec

Q.5 At certain place, the horizontal component of earth's magnetic field is 3.0 G and the angle dip at that place is 30^0. The magnetic field of earth at that location

(A) 4.5G (B) 5.1G

(C) 3.5 G (D) 6.0G

Q.6 The horizontal and vertical components of earth's magnetic field at a place are 0.3 G and 0.52 G. The earth's magnetic field and the angle of dip are

(A) 0.3 G and $\delta = 30°$ (B) 0.4 G and $\delta = 40°$

(C) 0.5 G and $\delta = 50°$ (D) 0.6 G and $\delta = 60°$

Q.7 The angle of dip at a place where horizontal and vertical components of earth's magnetic field are equal is

(A) 45° (B) 30°

(C) 0° (D) 60° (E) 90°

Q.8 In a certain place, the vertical component of earth's magnetic field is 0.5 oersted and dip is 60^0. The earth's magnetic field at that place is (oersted in C.G.S. unit of magnetic field intensity (H)

$1O_e = \frac{1000}{4\pi}\frac{A}{m}$

(A) 1 oersted (B) $\frac{\sqrt{3}}{2}oersted$ (C) 2 oersted (D) $\frac{1}{\sqrt{3}}oersted$

Q.9 Assertion : The magnetic poles of earth do not coincide with the geographic poles.
Reason: The discrepancy between the orientation of a compass and true north-south direction is known as magnetic declination.
(A)Both assertion and reason are true and reason is the correct explanation of the assertion.
(B) Both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) Assertion is true, reason is false.
(D) Both assertion and reason are false.

Q.10 If the horizontal component of the earth's magnetic field is 0.30 G, and the dip angle is 60^0 at a given place, then the value of earth's total magnetic field is
(A) 0.15G (B) $0.15\sqrt{3}G$
(C) $0.15\sqrt{2}G$ (D) 0.60G

Q.11 An iron rod is placed parallel to magnetic field of intensity 2000 A/m. The magnetic flux through the rod is $6\times10^{-4}Wb$ and its cross-sectional area is 3 cm^2. The magnetic permeability of the rod in Wb/A m is
(A) 10^{-1} (B) 10^{-2}
(C) 10^{-3} (D) 10^{-4}

Q.12 A magnetizing field of 1600 A m^{-1} produces a magnetic flux of $2.4\times10^{-5}Wb$ in an iron bar of cross-sectional area 0.2 cm^2. The susceptibility of an iron bar is
(A) 298 (B) 596
(C) 1192 (D) 1788

Q.13 χ_1 *and* χ_2 are susceptibility of a paramagnetic material at temperatures T_1 K and T_2 K respectively, then
(A) $\chi_1=\chi_2$ (B) $\chi_1T_1=\chi_2T_2$
(C) $\chi_1T_2=\chi_2T_1$ (D) $\chi_1\sqrt{T_1}=\chi_2\sqrt{T_2}$

Q.14 The temperature of transition from ferromagnetic property to paramagnetic property is called
(A) Transition temperature (B) Critical temperature
(C) Curie temperature (D) Triplet temperature.

Q.15 The magnetic susceptibility of a paramagnetic material at -73^0C is 0.0075 and its value at $-173\ ^0$C will be
(A) 0.0030 (B) 0.0075
(C) 0.0045 (D) 0.015

Q.16 The magnetic induction and the intensity of magnetic field inside an iron core of an electromagnetic are 1 Wb m^{-2} and 150 A m^{-1} respectively. The relative permeability of iron is $\left(\mu_0=4\pi\times10^{-7}\ henry\,m^{-1}\right)$
(A) $\frac{10^6}{4\pi}$ (B) $\frac{10^5}{6\pi}$ (C) $\frac{10^3}{4\pi}$ (D) $\frac{10^3}{6\pi}$

Q.17 Materials suitable for permanent magnets, must have which of the following properties?
(A) High retentively, low coercivity and high permeability
(B) Low retentively, low coercivity and high permeability
(C) Low retentively, high coercivity and high permeability
(D) High retentively, high coercivity and high permeability

ANSWER KEY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A	D	A	C	C	D	A	D	A	D	C	B	B	C	D	B	D