Code: Phy/ EM-3/Mag/003

Electromagnetism: Current Electricity – Typical Questions (Part-3)

Magnetism and Magnetic Properties

(Answers Only)

A-1	No
A-2	Yes.
A-3	No
A-4	In solenoid polarity depends upon direction of current while in magnetic dipole it is decided by its magnetization. Otherwise, magnetic field in solenoid and magnetic dipole is identical.
A-5	Same, except that direction of magnetic lines of force in solenoid depend on direction of current in the solenoid.
A-6	Yes
A-7	Yes
A-8	No
A-9	Yes, 90^0
A-10	(a) Yes (b) Yes
A-11	Yes, No
A-12	(a)
A-13	(b)
A-14	(c)
A-15	(d)
A-16	(c)
A-17	(c)
A-18	(d)

A-19	(d)
A-20	(d)
A-21	(c)
A-22	(c)
A-23	(b)
A-24	(a)
A-25	(a), (b)
A-26	(b), (d)
A-27	(a), (b)
A-28	(c), (d)
A-29	(b), (c), (d)
A-30	4×10^{-4} T
A-31	2.5×10^{-2} N
A-32	Decreases by 0.10×10^{-3} Tm
A-33	2.0×10^{-4} T
A-34	(a) 1.0 Am^2, and (b) 2.0 Am^2
A-35	True
A-36	6×10^{-2}Am
A-37	At a distance of 20 cm in the plane bisecting the dipole
A-38	20 cm south of the pole
A-39	20 cm from the dipole, at an angle $\theta = \tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$ West of North is the answer..
A-40	60 μT
A-41	6.8×10^{-5} T
A-42	45 μT, 52 μT

A-43	30^0
A-44	39^0
A-45	57 turns
A-46	2×10^{-4} Nm
A-47	3.75×10^3 Am^2/T
A-48	7.9 cm from the center
A-49	2.0 cm from the needle, north pole pointing towards south
A-50	1600 Am^2
A-51	13:12
A-52	0.076 s
A-53	$\sqrt{2}$ minutes
A-54	(a) 18 oscillations/min (b) 54 oscillations/min
A-55	Opposite behavior of electric and magnetic dipoles.
A-56	It depends induced magnetization characterized by its susceptibility χ and classification into diamagnetic, paramagnetic and ferromagnetic materials depends on value of χ.
A-57	No
A-58	No
A-59	Susceptibility of paramagnetic material is small $\mathbf{1 > \chi > 0}$
A-60	No
A-61	Electrical energy

A-62	Low losses and high accuracy
A-63	Magnetic shielding acts like that of Faraday's cage in electricity.
A-64	(b)
A-65	(c)
A-66	(c)
A-67	(c)
A-68	(b)
A-69	(a)

A-70	(d)
A-71	(a), (b)
A-72	(d)
A-73	(b)
A-74	(c), (d)
A-75	(a), (b), (c), (d)
A-76	(a), (d)
A-77	7.5
A-78	(a) 1500 A/m^{-1}, (b) 8.0×10^{-5} (c) Paramagnetic

A-79	(a) 0.4 A (b) 2.0×10^{-6} A/m (c) 800 Am
A-80	(a) 2.5 $A.m^2$ (b) 2.5×10^{6} A/m (c) 1.1 T
A-81	6.9×10^{-3}
A-82	1.2×10^{-3} and 1.2×10^{-3}
A-83	200 K
A-84	(a) 1.58×10^{6} A/m (b) 2.0 T
A-85	10 A

Important Note: You may encounter need of clarification on contents and analysis or an inadvertent typographical error. We would gratefully welcome your prompt feedback on mail ID: subhashjoshi2107@gmail.com. If not inconvenient, please identify yourself to help us reciprocate you suitably.

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