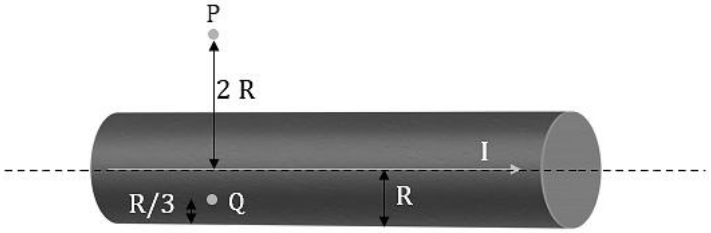
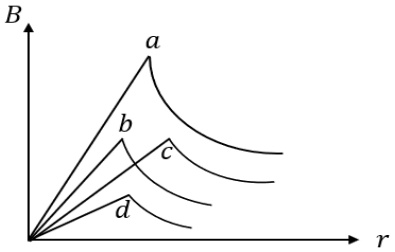
Q.1 A solid cylinder wire of radius R carries as current I. The magnetic field is 5 μT at a point, which is 2R distance away from the axis of the wire. Magnetic field at a point which is R/3 distance inside from the surface of the wire is



(A) $\frac{10}{3}$ Mt **(B)** $\frac{20}{3}$ μT **(C)** $\frac{5}{3}$ μT **(D)** $\frac{40}{3}$ μT

Q.2 Curves in the graph shown as functions of radial distance r, the magnitude B of the magnetic field inside and outside of four long wires a, b, c and d, carrying currents that are uniformly distributed across the cross-sections of the wires. The wire is far from one another. The current density in wire a is



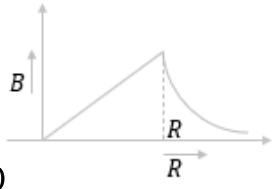
(A) greater than in wire *c* **(B)** less than in wire *b*
(C) equal to that in wire *d* **(D)** less than in wire *d*

Q.3 A hollow cylindrical wire carries a current I, having inner and outer radii R and 2R respectively. Magnetic field at a point which 3R/2 distance away from its axis is

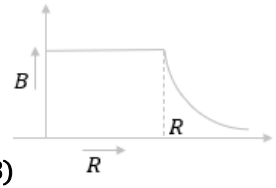
(A) $\frac{5\mu_0 I}{18\pi R}$ **(B)** $\frac{\mu_0 I}{36\pi R}$ **(C)** $\frac{5\mu_0 I}{36\pi R}$ **(D)** $\frac{5\mu_0 I}{9\pi R}$

Q.4 Draw a graph for a thin current carrying a hollow conductor for variation of the magnetic field with respect to distance R from its axis along the radius.

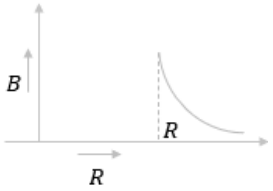
(A)



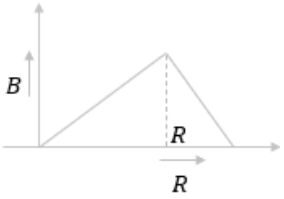
(B)



(C)



(D)



Q.5 Two infinite plane sheets A and B carrying current in same direction, and current per unit length are 6 A/m and λ A/m respectively. Find the value of λ so that the magnetic field at point P is zero.

(A) 2.5 A/m **(B)** 10 A/m **(C)** 5 A/m **(D)** 3.33 A/m

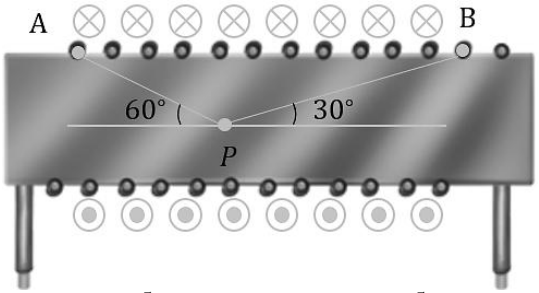
Q.6 Two infinitely large sheets A and *B* carrying current in same direction per unit length in A and B are 5 A/m and 10 A/m respectively. Then find the ratio of the magnetic field at p and q.

(A) 3 **(B)** $\frac{1}{9}$ **(C)** 9 **(D)** $\frac{1}{3}$

Q.7 In an ideal solenoid there are 330 turns with a length of 23 cm and a radius of cross- section 1.3 cm. It carries a current of 2.3 A. The current in the 330 turns solenoid increases steadily to 5.00 A in 0.9 s. Calculate the magnetic field of the 330 turns solenoid after 0.9 s

(A) 0.9×10^{-3} T **(B)** 0.009×10^{-3} T **(C)** 9×10^{-3} T **(D)** 0.09×10^{-3} T

Q.8 For the following diagram, determine the strength of the magnetic field at a point P shown inside the solenoid if the number of turns per unit length is 500 and a current of 0.5 A is flowing through it



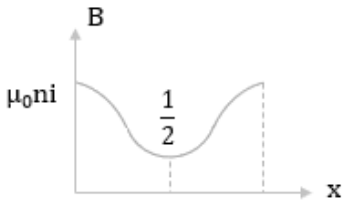
(A) 5.73×10^{-4} T **(B)** 5.73×10^{-5} T **(C)** 5.73×10^{5} T **(D)** 5.73×10^{-3} T

Q.9 The length of the solenoid is 0.1 m and its diameter is very small. A wire is wound over it in two layers. The number of turns in the inner layer is 50 and that in the outer layer is 40. The strength of current flowing in two layers in the opposite direction is 3 A. Then the magnetic induction at the middle of the solenoid is

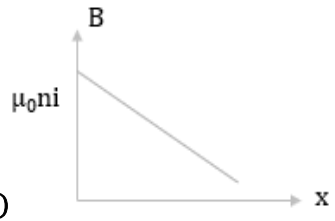
(A) $12\pi \times 10^{-5}$ T **(B)** $3\pi \times 10^{-5}$ T **(C)** $7\pi \times 10^{-5}$ T **(D)** $9\pi \times 10^{-5}$ T

Q.10 Which of the following graphs correctly represent the variation of magnetic field (B) inside a finite length solenoid with respect to distance x from its center. The current in a solenoid having n turns per unit length is I

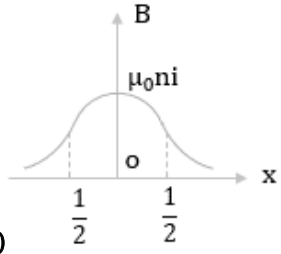
(A)



(B)



(C)



(D)

Q.	1	2	3	4	5	6	7	8	9	10

ANSWER KEY

Sol.	(B)	(A)	(C)	(B)	(C)	(A)	(C)	(B)	(A)	(D)