Q.1 A wire PQ is placed near an infinitely long straight current carrying wire. If both the wires carry the same current and the long wire is kept fixed, which of the following correctly represents the graph of force F vs x ?



- Q.2The force between two parallel conductors, each of length 50 m and distance 20 cm apart, is 10⁻² N.
If the current in one conductor is double to that in another one, then their values will respectively be
(A)10 A and 20 A(B)50 A and 100 A(C)5 A and 10 A(D)25 A and 50 A
- Q.3Two long and parallel straight wires A and B, carrying currents of 8.0 A and 5.0 A in the same
direction, are separated by a distance of 4.0 cm. Estimate the force on a 10 cm section of wire A
 $(A)2 \times 10^{-5}$ N(B)2 × 10^{-5} N(C)2 × 10^{-5} N(D)2 × 10^{-5} N
- **Q.4** Two long current carrying wires. separated by a distance d carry currents I₁ and I₂ in the same direction They exert a force F on each other. Now the current in one of them is increased to two times and its direction is reversed. The distance is also Increased to 3d The new value of the force between them is

(A)
$$\frac{-F}{3}$$

(C)
$$\frac{2F}{3}$$

(D) $\frac{-2F}{3}$

Q.5 The magnetic force between wires, as shown in figure is

 $(\mathbf{B})_{\frac{1}{2}}^{\mathrm{F}}$



$$(\mathbf{A})\frac{\mu_0 i l}{2\pi} \ln\left(\frac{x+L}{2x}\right) \qquad \qquad (\mathbf{B})\frac{\mu_0 i l}{2\pi} \ln\left(\frac{2x+L}{2x}\right) \qquad \qquad (\mathbf{C})\frac{\mu_0 i l}{2\pi} \ln\left(\frac{x+L}{x}\right) \qquad \qquad (\mathbf{D})\frac{\mu_0 i l}{2\pi} \ln\left(\frac{x+L}{x}\right)$$

Q.6 A, B and C are parallel conductors of equal lengths carrying currents i and 2i respectively. Distance between A and B is x. Distance between B and C is also x. F₁ is the force exerted by B on A. F₂ is the force exerted by C on A. Choose the correct relation among the following.



Q.7 Consider three long straight parallel wires as shown in figure. Find the force experienced by 25 cm length of wire C.



Q.8 An infinitely long straight conductor is fixed and carries a current I_1 . Another movable straight wire CD (of finite length) carrying a current I_2 is held perpendicular to it and released. Neglecting its weight, which of the statement is correct.

(A)Wire CD moves upward, parallel to itself

(B)Wire CD moves downward, parallel to itself.

(C)Wire CD moves upwards and turns clockwise at the same time

(D)Wire CD moves upwards and turns anticlockwise at the same time

Q.9 In the figure shown the wires AB and PQ carry constant currents I_1 and I_2 respectively. PQ is of uniformly distributed mass m and length l. AB and PQ are both horizontal and kept in the same vertical plane. The PQ is in equilibrium at height h, If the wire PQ is displaced vertically by small distance, then its time period of oscillation in terms of h and g



Q.10 In the figure shown, the wires AB and PQ carry steady currents, I_1 and I_2 respectively. PQ is of uniformly distributed mass m and length l. AB and PQ are both horizontal and kept in the same vertical plane. The PQ is in equilibrium at height h. Find h in terms of I_1 , I_2 , l, m and other standard constants.



Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(D)	(A)	(A)	(D)	(C)	(D)	(D)	(C)	(D)	(A)
ANSWER KEY										