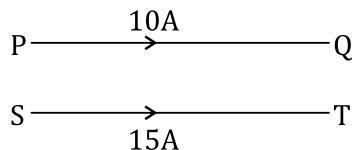
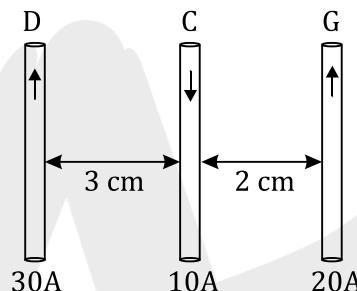


DPP - 05

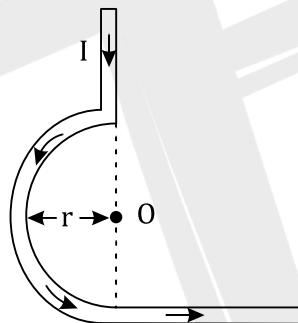
- Q.1** In the figure below the two parallel wires PQ and ST are at 30 cm apart. The currents flowing in the wires are according to figure. The force acting over a length of 5 m of the wires is $x \times 10^{-4}$ N. Find x.



- Q.2** Three long, straight parallel wires carrying current, are arranged as shown in the figure. The force (in newton) experienced by a 25 cm length of wire C is



- Q.3** In the figure, what is the magnetic field at the point O ?

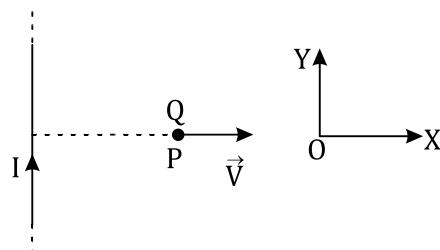


$$(A) \frac{\mu_0 I}{4\pi r} \quad (B) \frac{\mu_0 I}{4\pi r} + \frac{\mu_0 I}{2\pi r} \quad (C) \frac{\mu_0 I}{4r} + \frac{\mu_0 I}{4\pi r} \quad (D) \frac{\mu_0 I}{4r} - \frac{\mu_0 I}{4\pi r}$$

- Q.4** A square frame of side l carries a current i and produces a magnetic field B at its centre. If the same current is passed through a circular coil having the same perimeter as the square frame, it produces a field B' at its centre. Then B/B' will be

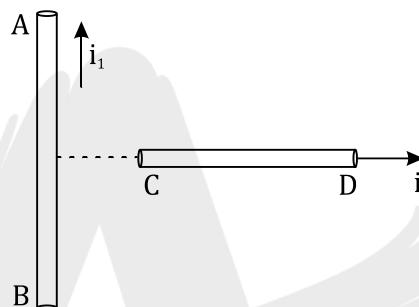
$$(A) \frac{8}{\pi^2} \quad (B) \frac{8\sqrt{2}}{\pi^2} \quad (C) \frac{16}{\pi^2} \quad (D) \frac{16}{\sqrt{2}\pi^2}$$

- Q.5** A very long straight wire carries a current I. At the instant when a charge $+Q$ at point P has velocity \vec{V} , as shown, the force on the charge is



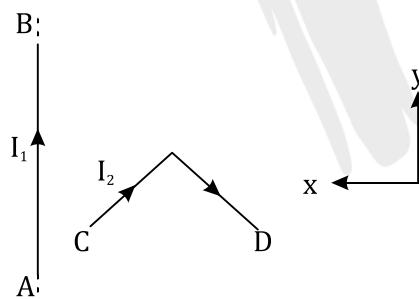
- (A) Opposite to OX (B) Along OX (C) Opposite to OY (D) Along OY

Q.6 An infinitely long, straight conductor AB is fixed and a current is passed through it. Another movable straight wire CD of finite length and carrying current is held perpendicular to it and released. Neglect weight of the wire

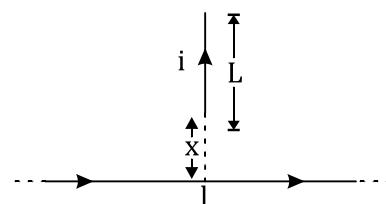


- (A) The rod CD will move upwards parallel to itself
 - (B) The rod CD will move downward parallel to itself
 - (C) The rod CD will move upward and turn clockwise at the same time
 - (D) The rod CD will move upward and turn anti-clockwise at the same time

Q.7 In the figure shown a current I_1 is established in the long straight wire AB. Another wire CD carrying current I_2 is placed in the plane of the paper. The line joining the ends of this wire is perpendicular to the wire AB. The resultant force on the wire CD is:

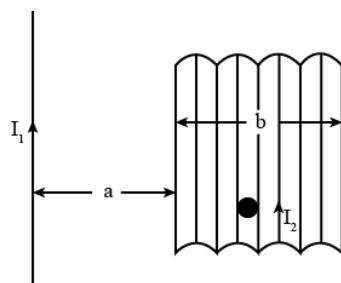


Q.8 The magnetic force between wires as shown in figure is



- (A) $\frac{\mu_0 i I^2}{2\pi} \ln \left(\frac{x+L}{2x} \right)$ (B) $\frac{\mu_0 i I^2}{2\pi} \ln \left(\frac{2x+L}{2x} \right)$ (C) $\frac{\mu_0 i I}{2\pi} \ln \left(\frac{x+L}{x} \right)$ (D) None of these

Q.9 A long straight wire carrying current I_1 is placed in the plane of a ribbon carrying current I_2 parallel to the wire. The width of ribbon is b . The straight conductor is placed at a distance ' a ' from the nearer edge of ribbon. Find the force of attraction per unit length between the two.



- (A) $\frac{\mu_0 I_1 I_2}{2\pi a} \log \frac{a+b}{b}$ (B) $\frac{\mu_0 I_1 I_2}{2\pi b} \log \frac{a}{a+b}$ (C) $\frac{\mu_0 I_1 I_2}{2\pi b} \log \frac{a}{b}$ (D) $\frac{\mu_0 I_1 I_2}{2\pi b} \log \frac{(a+b)}{a}$



ANSWER KEY

1. 5 2. 0 3. (C) 4. (B) 5. (D) 6. (C) 7. (D)
8. (C) 9. (A)

