IIT PHYSICS CENTRE

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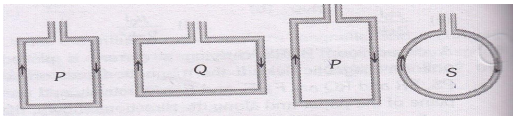
1. A current carrying loop is placed in a magnetic field. The torque acting on it does not happen upon
(A) Shape of the loop **(B)** Area of the loop
(C) Value of the current **(D)** Magnetic field

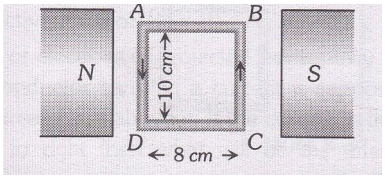
2. A small coil of N turns has an effective area A and carries a current I. It is suspended in a horizontal magnetic field $\vec{B}$ such taht its plane is perpendicular to $\vec{B}$. The work done in rotating it by 180^0 about the vertical axis is
(A) NAIB **(B)** 2NAIB **(C)** 2® NAIB **(D)** 4® NAIB

3. Four wire each of length 2.0 metres are bent into four loops P,Q,R and S and then suspended into uniform magnetic field. Same current is passed in each loop. Which statement is correct



(A) Couple on loop P will be the highest
(B) Couple on loop Q will be the highest
(C) Couple on loop R will be the highest
(D) Couple on loop S will be the highest

4. A 100 turns coil shown in figure carries a current of 2 amp in a magnetic field $B = 0.2\ Wb/m^2$. The torque acting on the coil is

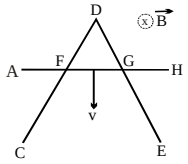


(A) 0.32 Nm tending to rotate the side AD out of the page
(B) 0.32 Nm tending to rotate the side AD into the page
(C) 0.0032 Nm tending to rotate the side AD out of the page
(D) 0.0032 Nm tending to rotate the side AD into the page

5. If a current passed in a spring, it
(A) Gets compressed **(B)** Gets expanded
(C) Oscillates **(D)** Remain unchanged

6. The magnetic flux ¤ (in weber) in a closed circuit of resistence 10 Ω varies with time t (in second) according to equation $¤ = 6t^2 - 5t + 1$. The magnitude of induced current at t = 0.25s is :
(A) 1.2 A **(B)** 0.8 A **(C)** 0.6 A **(D)** 0.2 A

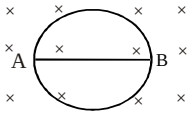
7. A long conducting wire AH is moved over a conducting triangular wire CDE with a constant velocity v in a uniform magnetic field $\vec{B}$ directed into the paper. Resistance per unit length of each wire is p. Then:



(A) A constant clocckwise induced current will flow in closed loop
(B) An increasing anticlockwise induced current will flow in the closed loop
(C) A decreasing anticlockwise induced current will flow in the closed loop
(D) A constant anticlockwise induced current will flow in the closed loop

8. A magnet is allowed to fall through a copper circular wire. Then during fall :
(A) The electric current flows through a wire
(B) The acceleration of magnet is less than gravitational acceleration
(C) The acceleration of magnet is equal to gravitational acceleration
(D) The acceleration of magnet is greater than gravitational acceleration

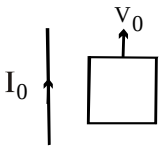
9. The radius of the circular conducting loop shown in figure is R. Magnetic field is decresing at a constant rate ~ . Resistance per unit length of the loop is r .Then
current in wire AB is (AB is one of the diametre)



(A) $\frac{R\sim}{2°}$ from A to B **(B)** $\frac{R\sim}{2°}$ from B to A

(C) $\frac{2R\sim}{°}$ from A to B **(D)** Zero

10. A constant current I_0 is passing through a long straight wire (shown in figure). A rectangular loop of total resistance R is moving parallel to the wire. Then:



(A) The heat generated in the loop is with constant rate
(B) Current in the loop is zero
(C) Velocity of loop will decrease according to Lenz`s law
(D) None.