PHYSICS

1. (2)

$$I = \frac{e}{R} = \frac{1}{R}\left(\frac{d\phi}{dt}\right) \Rightarrow Q = \frac{\Delta\phi}{R}$$

2. (2)

3. (3)

$\phi = B(\pi r^2)$

$$\Rightarrow e = \frac{d\phi}{dt} = B(2\pi r)\frac{dr}{dt}$$

$$= (0.025)(2\pi)(2\times10^{-2})(10^{-3}) = \pi\mu V$$

4. (4)

$$q = \frac{\Delta\phi}{R}$$

$$\Rightarrow \Delta\phi = qR = (\text{Area under the curve}) \times R$$

$$= \frac{4\times0.1}{2}\times10 = 2 \text{ Wb}$$

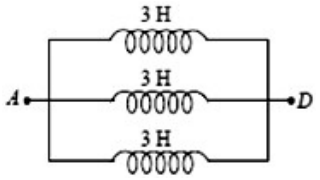
5. (3)

$$e_{av} = \frac{\Delta\phi}{\Delta t} = \frac{B\pi r^2}{\Delta t}$$

6. (3)

7. (4)

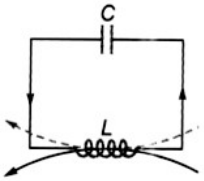
Given circuit can be reduced to



$$\frac{1}{L_{eff}} = \frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3}$$

$$\Rightarrow \frac{1}{L_{eff}} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1 \Rightarrow L_{eff} = 1 \text{ H}$$

8. (4)



$$\frac{q}{C} + L\frac{dI}{dt} = 0$$

$$\Rightarrow \frac{d^2q}{dt^2} + \frac{q}{LC} = 0$$

which is equation of oscillatory motion

Current starts oscillation.

9. (2)

10. (1)