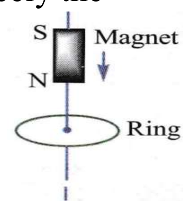
Electro Magnetic Induction-1

1. A coil of resistance 10Ω and 1000 turns have the magnetic flux line of 5.5×10^{-4} Wb. If the magnetic flux changed to 5×10^{-4} Wb. In 0.1 sec, then the induced charge in coil is
(A) 50 μC (B) 5 μC (C) 2 μC (D) 20 μC

2. A square loop of side 22cm is changed to a circle in time 0.4s. The magnetic field present is 0.2T. The emf induced is
(A) –6.6 mV (B) –13.2 mV (C) +6.6 mV (D) +13.2 mV

3. Consider a metal ring kept on a horizontal plane. A bar magnet is held above the ring with its length along the axis of the ring. If the magnet is dropped freely the acceleration of the falling magnet is (g is acceleration due to gravity)

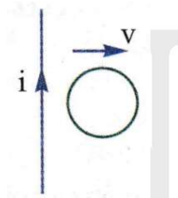


(A) More than g
(B) Equal to g
(C) Less than g
(D) Depend on mass of magnet

4. If number of turns of $70 cm^2$ coil is 200 and it is placed in a magnetic field of 0.8 Wb/m^2 which is perpendicular to the plane of coil and it is rotated through an angle 180^o in 0.1 sec, then induced emf in coil
(A) 11.2 V (B) 1.12 V (C) 22.4 V (D) 2.24 V

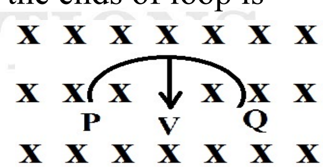
5. A circular loop of radius r is placed in a region where magnetic field increases with respect to time as B(t) = at then induced emf in coil
(A) $\pi r^2 a$ (B) $3\pi r^2 a$ (C) $2\pi r^2 a$ (D) $4\pi r^2 a$

6. A circular loop of radius r is moved away from a current carrying wire then induced current in circular loop will be



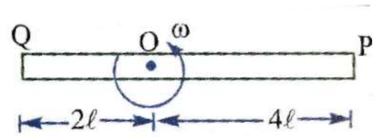
(A) Clockwise
(B) Anti clockwise
(C) Not induced
(D) None of them

7. A semicircle loop PQ of radius 'R is moved with velocity 'v' in transverse magnetic field as shown in figure. The value of induced emf, between the ends of loop is



(A) Bv (πR), end 'P' at high potential.
(B) 2 BRv, end 'P' at high potential.
(C) 2 BRv, end 'Q' at high potential.
(D) B $\frac{\pi R^2}{2}$ v, end 'P' at high potential.

8. A conducting rod rotates with a constant angular velocity 'ω' about the axis which passes through point 'O' and perpendicular to its length. A uniform magnetic field 'B' exists parallel to the axis of the rotation. Then potential difference between the two ends of the rod is



(A) $6B\omega\ell^2$ (B) $B\omega\ell^2$
(C) $10B\omega\ell^2$ (D) Zero

9. A metallic disc of radius ‘R’ is rotating about its geometrical axis with constant angular speed ‘ω in external magnetic field B which is perpendicular to the plane of the disc then induced emf between the centre and any peripherical point of the disc is given by

(A) $\pi\omega BR^2$ (B) ωBR^2 (C) $\frac{\pi\omega BR^2}{2}$ (D) $\frac{\omega BR^2}{2}$

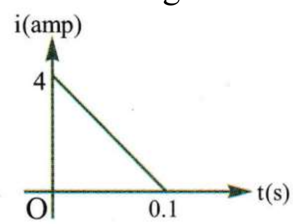
10. A circular disc of radius 0.2 meter is placed in a uniform magnetic field of $\frac{1}{\pi}$ wb/m^2 in such way that its axis makes an angle of 60^o with $\overline{B}$. The magnetic flux linked with the disc is

(A) 0.08 wb (B) 0.01 wb (C) 0.02 wb (D) 0.06 wb

11. A rectangular, a square, a circular and an elliptical loop, all in the (x-y) plane, are moving out of a uniform magnetic field with a constant velocity, $\overline{V} = v\hat{\imath}$. The magnetic field is directed along the negative z axis direction. The induced emf, during the passage of these loops, out of the field region, will not remain constant for

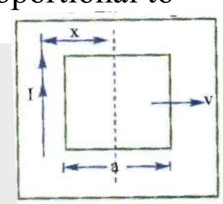
(A) any of the four loops. (B) the rectangular, circular and elliptical loops.
(C) the circular and the elliptical loops. (D) only the elliptical loop.

12. In a coil of resistance 10Ω, the induced current developed by changing magnetic flux through it, is shown in figure as a function of time. The magnitude of change in flux through the coil in Weber is



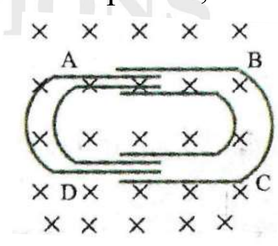
(A) 6
(B) 4
(C) 8
(D) 2

13. A conducting square frame of side ‘a’ and a long straight wire carrying current I are located in the same plane as shown in the figure. The frame moves to the right a constant velocity ‘V’. The emf induced in the frame will be proportional to



(A) $\frac{1}{(2x-a)^2}$ (B) $\frac{1}{(2x+a)^2}$
(C) $\frac{1}{(2x-a)(2x+a)}$ (D) $\frac{1}{x^2}$

14. One conducting U tube can slide inside another as shown in figure, maintaining electrical contacts between the tubes. The magnetic field B is perpendicular to the plane of the figure. If each tube moves towards the other at a constant speed v, then the induced emf in the circuit, where ℓ is the width of each tube



(A) $2B\ell v$
(B) Zero
(C) $-B\ell v$
(D) $B\ell v$

15. A conducting ring of radius 1 meter is placed in an uniform magnetic field B of 0.01 T, oscillating with frequency 100 hz with its plane at right angles to magnetic field. What will be the induced electric field

(A) π volts/m (B) 2π volts/m (C) 10 volts/m (D) 62 volts/m

Physics Worksheet–17						**Electro Magnetic Induction-1**								**07-02-2019**
1-B	**2-A**	**3-C**	**4-C**	**5-A**	**6-A**	**7-C**	**8-A**	**9-D**	**10-C**	**11-C**	**12-D**	**13-C**	**14-A**	**15-A**