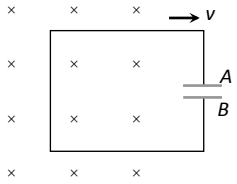
DPP

DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 1**

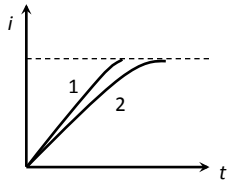
Topic :-Electro Magentic Induction

1. A step-down transformer is used on a 1000 V line to deliver 20 A at 120 V at the secondary coil. If the efficiency of the transformer is 80%, the current drawn from the line is
   a) 3 A b) 30 A c) 0.3 A d) 2.4 A
2. When a bar magnet falls through a long hollow metal cylinder fixed with its axis vertical, the final acceleration of the magnet is
   a) Equal to zero b) Less than g
   c) Equal to g d) Equal to g in the beginning and then more than g
3. The coils of a step down transformer have 500 and 5000 turns. In the primary coil an ac of 4 $ampere$ at 2200 $volts$ is sent. The value of the current and potential difference in the secondary coil will be
   a) 20 A, 220 V b) 0.4 A, 22000 V c) 40 A, 220 V d) 40 A, 22000 V
4. A step-down transformer reduces the voltage of a transmission line from 2200 V to 220 V. The power delivered by it is 880 W and its efficiency is 88%. The input current is
   a) 4.65 mA b) 0.045 A c) 0.45 A d) 4.65 A
5. A 100% efficient transformer has 100 turns in the primary and 25 turns in its secondary coil. If the current in the secondary coil is 4 amp, then the current in the primary coil is
   a) 1 amp b) 4 amp c) 8 amp d) 16 amp
6. A conducting loop having a capacitor is moving outward from the magnetic field then which plate of the capacitor will be positive



   a) Plate $-A$ b) Plate $-B$
   c) Plate $-A$ and Plate $-B$ both d) None
7. The number of turns of primary and secondary coils of a transformer are 5 and 10 respectively and the mutual inductance of the transformer is 25 $henry$. Now the number of turns in the primary and secondary of the transformer are made 10 and 5 respectively. The mutual inductance of the transformer in $henry$ will be
   a) 6.25 b) 12.5 c) 25 d) 50

8. When a certain circuit consisting of a constant e.m.f. E, an inductance L and a resistance R is closed, the current in it increases with time according to curve 1. After one parameter (E, L or R) is changed, the increase in current follows curve 2 when the circuit is closed second time. Which parameter was changed and in what direction



a) L is increased b) L is decreased c) R is increased d) R is decreased

9. 2m long wire is moved with a velocity 1ms^{-1} in a magnetic field of intensity 0.5 Wbm^{-2} in direction perpendicular to the field. The emf induced in it will be

a) 2 V b) 1 V c) 0.1V d) 0.5 V

10. A conducting circular loop is placed in a uniform magnetic field of induction B tesla with its plane normal to the field. Now, the radius of the loop starts shrinking at the rate $\left(\frac{dr}{dt}\right)$. Then, the induced emf at the instant when the radius is r,is

a) $\pi rB\left(\frac{dr}{dt}\right)$ b) $2\pi rB\left(\frac{dr}{dt}\right)$ c) $\pi r^2\left(\frac{dB}{dt}\right)$ d) $\left(\frac{\pi r^2}{2}\right)B\left(\frac{dr}{dt}\right)$

11. A coil of 1000 turns is wound on a book and this book is lying on the table. The vertical component of earth's magnetic field is 0.6×10^{-4} T and the area of the coil is 0.05 m^{-2}. The book is turned over once about a horizontal axis is 0.1 s. This average emf induced in the coil is

a) 0.03 V b) 0.06 V c) Zero d) 0.6 V

12. Mutual inductance of two coils can be increased by

a) Decreasing the number of turns in the coils b) Increasing the number of turns in the coils
c) Winding the coils on wooden core d) None of the above

13. If a coil made of conducting wires is rotated between poles pieces of the permanent magnet. The motion will generate a current and this device is called

a) An electric motor b) An electric generator c) An electromagnet d) All of the above

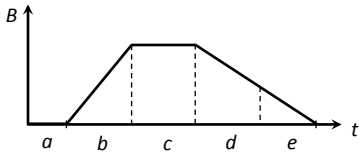
14. A circular coil has 500 turns of wire and its radius is 5 cm. The self inductance of the coil is

a) 25×10^{-3}mH b) 25 mH c) 50×10^{-3}H d) 50×10^{-3}mH

15. A conducting rod of length l is moving in a transverse magnetic field of strength B with velocity v. The resistance of the rod is R. the current in the rod is

a) $\frac{Blv}{R}$ b) Blv c) Zero d) $\frac{B^2v^2l^2}{R}$

16. The graph gives the magnitude $B(t)$ of a uniform magnetic field that exists throughout a conducting loop, perpendicular to the plane of the loop. Rank the five regions of the graph according to the magnitude of the emf induced in the loop, greatest first



a) $b > (d = e) < (a = c)$ b) $b > (d = e) > (a = c)$

c) $b < d < e < c < a$ d) $b > (a = c) > (d = e)$

17. 5 cm long solenoid having 10 ohm resistance and 5 mH inductance is joined to a 10 $volt$ battery. At steady state the current through the solenoid in $ampere$ will be

a) 5 b) 1 c) 2 d) Zero

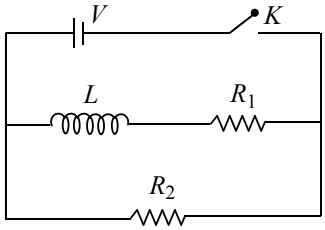
18. A horizontal straight wire 20 m long extending from east to west is falling with a speed of 5.0 ms^{-1},at right angles to the horizontal component of the earth's magnetic field 0.030×10^{-4} Wbm^{-2}.the instantaneous value of the emf induced in the wire will be

a) 6.0 mV b) 3 mV c) 4.5 mV d) 1.5 mV

19. If the coefficient of mutual induction of the primary and secondary coils of an induction coils is 5 H and current of 10 A is cut-off in 5×10^{-4}s, the emf inducted (in volt) in the secondary coil is

a) 5×10^4 b) 1×10^5 c) 25×10^5 d) 5×10^6

20. In the circuit shown below, the key K is closed at $t = 0$. The current through the battery is



a) $\frac{V(R_1+R_2)}{R_1R_2}$ at $t = 0$ and $\frac{V}{R_2}$ at $t = \infty$ b) $\frac{V(R_1+R_2)}{\sqrt{R_1^2R_2^2}}$ at $t = 0$ and $\frac{V}{R_2}$ at $t = \infty$

c) $\frac{V}{R_2}$ at $t = 0$ and $\frac{V(R_1+R_2)}{R_1R_2}$ at $t = \infty$ d) $\frac{V}{R_2}$ at $t = 0$ and $\frac{V(R_1+R_2)}{\sqrt{R_1^2R_2^2}}$ at $t = \infty$