

Chapter :- **Electro Magentic Induction**

Assignment 1

Class 12

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

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| **Topic :-Electro Magentic Induction**  |

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| 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**B**v* |
|  | 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 aresistance $R$ is closed, the current in it increases with time according to curve 1.After one parameter$ \left(E, L or R\right) $is changed, the increase in current follows curve2 when the circuit is closed second time. Which parameter was changed and inwhat direction*i**t*12 |
|  | 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 1$ms^{-1}$ 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) | $$πrB\left(\frac{dr}{dt}\right)$$ | b) | $$2πrB\left(\frac{dr}{dt}\right)$$ | c) | $$πr^{2}\left(\frac{dB}{dt}\right)$$ | d) | $$\left(\frac{πr^{2}}{2}\right)B\left(\frac{dr}{dt}\right)$$ |
| 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) | $$\frac{B^{2}v^{2}l^{2}}{R}$$ |
| 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**c**d**e**t**B* |
|  | a) | $$b>\left(d=e\right)<\left(a=c\right)$$ | b) | $$b>\left(d=e\right)>\left(a=c\right)$$ |
|  | c) | $$b<d<e<c<a$$ | d) | $$b>\left(a=c\right)>(d=e)$$ |
| 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) | $\frac{V\left(R\_{1}+R\_{2}\right)}{R\_{1}R\_{2}}$ at $t=0$ and $\frac{V}{R\_{2}}$ at $t=\infty $ | b) | $\frac{V\left(R\_{1}+R\_{2}\right)}{\sqrt{R\_{1}^{2}R\_{2}^{2}}}$ at $t=0$ and $\frac{V}{R\_{2}}$ at $t=\infty $ |
|  | c) | $\frac{V}{R\_{2}}$ at $t=0$ and $\frac{V\left(R\_{1}+R\_{2}\right)}{R\_{1}R\_{2}}$ at $t=\infty $ | d) | $\frac{V}{R\_{2}}$ at $t=0$ and $\frac{V\left(R\_{1}+R\_{2}\right)}{\sqrt{R\_{1}^{2}R\_{2}^{2}}}$ at $t=\infty $ |