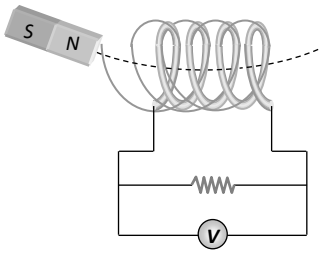
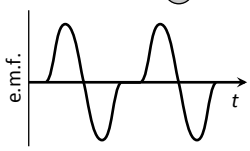
DPP
DAILY PRACTICE PROBLEMS

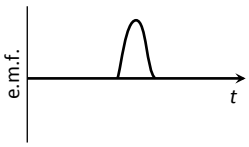
Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 7**

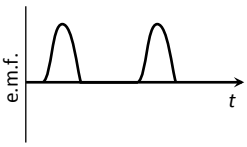
Topic :-Electro Magentic Induction

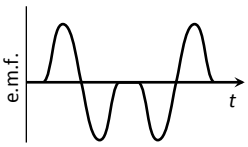
1. A coil of $N=100$ turns carries a current $I=5$ A and creates a magnetic flux $\phi = 10^{-5}$ Tm^2 per turn. The value of its inductance L will be
   a) 0.05 mH b) 0.10 mH c) 0.15 mH d) 0.20 mH
2. Core of transformer is made up of
   a) Soft iron b) Steel c) Iron d) Alnico
3. Eddy currents are produced when
   a) A metal is kept in varying magnetic field
   b) A metal is kept in the steady magnetic field
   c) A circular coil is placed in a magnetic field
   d) Through a circular coil, current is passed
4. In a transformer the primary has 500 *turns* and secondary has 50 *turns*. 100 *volts* is applied to the primary coil, the voltage developed in the secondary will be
   a) 1 V b) 10 V c) 1000 V d) 10000 V
5. For a large industrial city with much load variations the DC generator should be
   a) Series b) Shunt wound c) Mixed wound d) Any
6. Find out the e.m.f. produced when the current changes from 0 to 1 A in 10 *second*, given $L = 10\ \mu H$
   a) 1 V b) 1 μV c) 1 mV d) 0.1 V
7. A magnet is made to oscillate with a particular frequency, passing through a coil as shown in figure. The time variation of the magnitude of e.m.f. generated across the coil during one cycle is



a) 

b) 

c) 

d) 

8. A coil has an inductance of 2.5 H and a resistance of 0.5 r. If the coil is suddenly connected

across a 6.0 $volt$ battery, then the time required for the current to rise 0.63 of its final value is

a) 3.5 sec b) 4.0 sec c) 4.5 sec d) 5.0 sec

9. 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 $\vec{V} = v\,\vec{i}$. 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) The rectangular, circular and elliptical loops b) The circular and the elliptical lops

c) Only the elliptical loop d) Any of the four loops

10. In what form is the energy stored in an inductor **or**

A coil of inductance L is carrying a steady current i. What is the nature of its stored energy

a) Magnetic b) Electrical

c) Both magnetic and electrical d) Heat

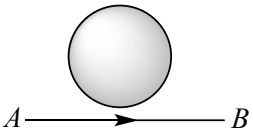
11. A circular metal plate of radius R is rotating with a uniform angular velocity ω with its plane perpendicular to a uniform magnetic field B. Then the emf developed between the centre and the rim of the plate is

a) $\pi\omega BR^2$ b) ωBR^2 c) $\pi\omega BR^2/2$ d) $\omega BR^2/2$

12. There is an arial 1 m long in a car. It is moving from east to west with a velocity of 100 kmh^{-1}. If the horizontal component of earth's magnetic field is 0.18 gauss, this induced emf is nearly

a) 0.5 mV b) 0.25 mV c) 0.75 mV d) 1 mV

13. The current from A to B is increasing in magnitude. What is the direction of induced current, if any, in the loop shown in figure.



a) No current is induced b) Clock-wise current

c) Anti-clock-wise current d) Alternating current

14. In L-R circuit, for the case of increasing current, the magnitude of current can be calculated by using the formula

a) $I = I_0 e^{-Rt/L}$ b) $I = I_0(1 - e^{-Rt/L})$ c) $I = I_0(1 - e^{Rt/L})$ d) $I = I_0 e^{Rt/L}$

15. The current in a coil changes from 4 $ampere$ to zero in 0.1 s. If the average e.m.f. induced is 100 $volt$, what is the self inductance of the coil

a) 2.5 H b) 25 H c) 400 H d) 40 H

16. The coil of dynamo is rotating in a magnetic field. The developed induced e.m.f. changes and the number of magnetic lines of force also changes. Which of the following conditions is correct

a) Lines of force minimum but induced e.m.f. is zero

b) Lines of force maximum but induced e.m.f. is zero

c) Lines of force maximum but induced e.m.f. is not zero

d) Lines of force maximum but induced e.m.f. is also maximum

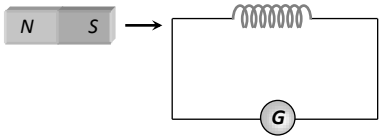
17. A coil of inductance 300 mH and resistance 2Ω is connected to a source of voltage 2V. The current reaches half of its steady state value in

a) 0.15 s b) 0.3 s c) 0.05 s d) 0.1 s

18. Two concentric coils each of radius equal to $2\pi\ cm$ are placed at right angles to each other. 3 A and 4 A are the currents flowing in each coil respectively. The magnetic induction in Wb/m^2 at the centre of the coils will be
($\mu_0 = 4\pi \times 10^{-7} Wb/Am$)
a) 12×10^{-5} b) 10^{-5} c) 5×10^{-5} d) 7×10^{-5}

19. A 16 μF capacitor is charged to a 20 volt potential. The battery is then disconnected and pure 40 mH coil is connected across the capacitor so that LC oscillations are setup. The maximum current in the coil is
a) 0.2 A b) 40 mA c) 2 A d) 0.4 A

20. As shown in the figure, a magnet is moved with a fast speed towards a coil at rest. Due to this induced electromotive force, induced current and induced charge in the coil is E, I and Q respectively. If the speed of the magnet is doubled, the incorrect statement is



a) E increases b) I increases c) Q remains same d) Q increases