

INTERNATIONAL INDIAN SCHOOL BURAIDAH

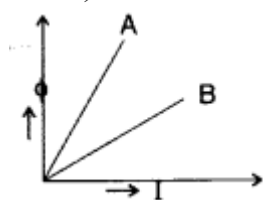
Worksheet for the Academic Year 2023-24

CLASS:_XII SUBJECT: PHYSICS

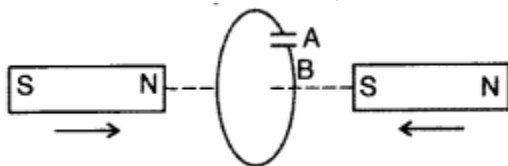
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LESSON :_ELECTROMAGNETIC INDUCTION

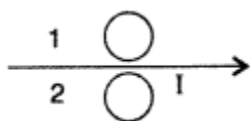
1.A plot of magnetic flux (ϕ) versus current (I) is shown in the figure for two inductors A and B. Which of the two has larger value of self inductance? (Delhi 2010)



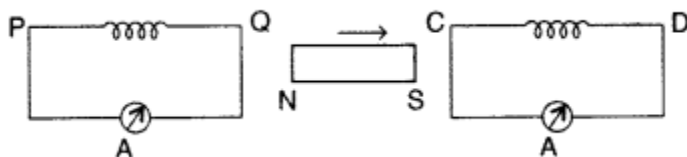
2.Predict the polarity of the capacitor when the two magnets are quickly moved in the directions marked by arrows.



3.Predict the directions of induced currents in metal rings 1 and 2 lying in the same plane where current I in the wire is increasing steadily.



4.A bar magnet is moved in the direction indicated by the arrow between two coils PQ and CD. Predict the directions of induced current in each coil. (All India 2012)



5.How does the mutual inductance of a pair of coils change when

- (i) distance between the coils is increased and
- (ii) number of turns in the coils is increased

6. An inductor 200 mH, capacitor 500 μ F, resistor 10 Ω are connected in series with a 100 V variable frequency a.c. source. Calculate the

- (i) frequency at which the power factor of the circuit is unity
- (ii) current amplitude at this frequency
- (iii) Q-factor (Delhi 2008)

7. A coil of number of turns N , area A , is rotated at a constant angular speed ω , in a uniform magnetic field B , and connected to a resistor R . Deduce expressions for :

- (i) Maximum emf induced in the coil.
- (ii) Power dissipation in the coil. (Delhi 2008)

8.(a) Define self inductance. Write its S.I. units.

(b) Derive an expression for self inductance of a long solenoid of length l , cross-sectional area A having N number of turns.

9.(i) Define mutual inductance.

(ii) A pair of adjacent coils has a mutual inductance of 1.5 H. If the current in one coil changes from 0 to 20 A in 0.5 s, what is the change of flux linkage with the other coil? (Delhi 2015)

10. State Lenz's law. Explain, by giving examples that Lenz's law is a consequence of conservation of energy.

