

**O P JINDAL SCHOOL, SAVITRINAGAR**

**ASSIGNMENT**

**CLASS XII PHYSICS**

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61 Phenomenon of production of induced emf due to change of magnetic flux linked with a closed circuit is known as \_\_\_\_\_.

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ANS: electromagnetic induction

62 Direction of induced current is such that it \_\_\_\_\_ the cause which produces it.

1

ANS: opposes

63 A long straight current carrying wire passes normally through the centre of circular loop. If the current through the wire increases, will there be an induced emf in the loop? Justify.

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ANS: No current will be induced since the field lines are lying in the plane of the closed loop.  
Refer to Ans. 6.1(f) NCERT Exercises.

64 The self-inductance  $L$  of a solenoid of length  $l$  and area of cross-section  $A$ , with a fixed number of turns  $N$  increases as  
[NCERT Exemplar]

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(a)  $l$  and  $A$  increase.

- (b) I decreases and A increases.
- (c) I increases and A decreases.
- (d) both I and A decrease.

ANS: (b)

65 A metal plate is getting heated. It can be because [NCERT Exemplar]

- (a) a direct current is passing through the plate.
- (b) it is placed in a time varying magnetic field.
- (c) it is placed in a space varying magnetic field, but does not vary with time.
- (d) a current (either direct or alternating) is passing through the plate.

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ANS: (a), (b), (d)

66 The self-inductance of a coil having 500 turns is 50 mH. The magnetic flux through the cross-sectional area of the coil while current through it is 8 mA is found to be

- (a)  $4 \times 10^{-4}$  Wb
- (b) 0.04 Wb
- (c) 4 m Wb
- (d) 40 m Wb

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ANS: (a) Magnetic flux,  $\phi = LI = 50 \times 10^{-3} \times 8 \times 10^{-3}$  Wb  
 $= 4 \times 10^{-4}$  Wb

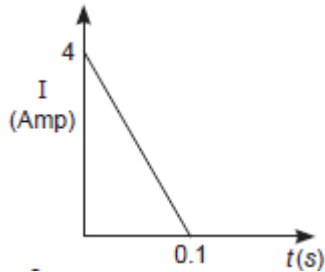
67 While keeping area of cross-section of a solenoid same, the number of turns and length of solenoid are both doubled. The self-inductance of the coil will be

- (a) halved.
- (b) doubled.
- (c)  $\frac{1}{4}$  times the original value.
- (d) unaffected.

1

ANS: (b) Coefficient of self-inductance,  $L = \frac{\mu_0 N^2 A}{l}$

68 In a coil of resistance  $10 \pi$ , the induced current developed by changing magnitude of change in flux through the coil is weber is  
 (a) 8 (b) 2



(c) 6 (d) 4

(b) Charge,  $q = It = \text{Area under graph}$

ANS:  $q = \frac{\Delta\phi}{R}$ ,  $\Delta\phi = qR = 0.2 \times 10 = 2 \text{ W}$

69 A metal ring is held horizontally and bar magnet is dropped through the ring with its length along the axis of the ring. The acceleration of the falling magnet is

- (a) equal to g.
- (b) less than g.
- (c) more than g.
- (d) first increases then decreases.

ANS: (b) The induced e.m.f. in the ring opposes the motion of the falling magnet hence,  $a < g$ .

70 A coil of resistance  $400 \Omega$  is placed in a magnetic field. If the magnetic flux  $\phi$  linked with the coil varies with times  $t$  (sec) as  $\phi = 50t^2 + 4$ , the current in the coil at  $t = 2$  sec is

- (a) 0.5 A (b) 0.1 A

(c) 2 A (d) 1 A

$$(a) \text{ e.m.f., } \varepsilon = \frac{-d\phi}{dt} = -100t,$$

ANS: 
$$I = \frac{\varepsilon}{R} = \frac{100 \times 2}{400} = 0.5 \text{ A (as } t = 2 \text{ sec)}$$

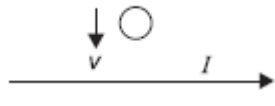
71 Phenomenon of production of induced e.m.f. in a coil when a changing current passes through it is known as \_\_\_\_\_ . 1

ANS: self-inductance

72 When magnetic lines of force are parallel to a closed surface, then the net magnetic flux through the surface is \_\_\_\_\_ . 1

ANS: zero

73 Predict the direction of induced current in a metal ring when the ring is moved towards a straight conductor with constant speed

v. The conductor is carrying current  $I$  in the direction shown in the figure \_\_\_\_\_  1

ANS: Clockwise.