TIME:1HR MCQ TEST CH-ELECTROMAGNETIC INDUCTION MM:45MARKS

NAME:

Q.1. Whenever the magnetic flux linked with an electric circuit changes, an emf is induced in the circuit. This is called
(a) electromagnetic induction
(b) lenz's law
(c) hysteresis loss
(d) kirchhoff's laws

Answer

Q.2. In electromagnetic induction, the induced charge is independent of
(a) change of flux
(b) time.
(c) resistance of the coil
(d) None of these

Answer

Q.3. An induced e.m.f. is produced when a magnet is plunged into a coil. The strength of the induced e.m.f. is independent of
(a) the strength of the magnet
(b) number of turns of coil
(c) the resistivity of the wire of the coil
(d) speed with which the magnet is moved

Answer

Q.4. According to Faraday's law of electromagnetic induction
(a) electric field is produced by time varying magnetic flux.
(b) magnetic field is produced by time varying electric flux.
(c) magnetic field is associated with a moving charge.
(d) None of these

Answer

Q.5. A moving conductor coil produces an induced e.m.f. This is
in accordance with
(a) Lenz's law
(b) Faraday's law
(c) Coulomb's law
(d) Ampere's law

Answer

Q.6. A coil of insulated wire is connected to a battery. If it is taken to galvanometer, its pointer is deflected, because
(a) the induced current is produced
(b) the coil acts like a magnet
(c) the number of turns in the coil of the galvanometer are changed
(d) None of these

Answer

Q.7. The polarity of induced emf is given by
(a) Ampere's circuital law
(b) Biot-Savart law
(c) Lenz's law
(d) Fleming's right hand rule

Answer

Q.8. The self inductance of a coil is a measure of
(a) electrical inertia
(b) electrical friction
(c) induced e.m.f.
(d) induced current

Answer

Q.9. The coils in resistance boxes are made from doubled insulated wire to nullify the effect of
(a) heating
(b) magnetism
(c) pressure
(d) self induced e.m.f.

Answer

Q.10. Two pure inductors each of self inductance L are connected in series, the net inductance is
(a) L
(b) 2 L

(c) L/2
(d) L/4

Answer

Q.11. Lenz's law is a consequence of the law of conservation of
(a) charge
(b) mass
(c) energy
(d) momentum

Answer

Q.12. A magnet is moved towards a coil (i) quickly (ii) slowly, then the induced e.m.f. is
(a) larger in case (i)
(b) smaller in case (i)
(c) equal to both the cases
(d) larger or smaller depending upon the radius of the coil

Answer

Q.13. The laws of electromagnetic induction have been used in the construction of a
(a) galvanometer
(b) voltmeter
(c) electric motor
(d) generator

Answer

Q.14. Two coils are placed closed to each other. The mutual inductance of the pair of coils depends upon
(a) the rate at which currents are changing in the two coils.
(b) relative position and orientation of two coils.
(c) the material of the wires of the coils.
(d) the currents in the two coils.

Answer

Q.15. Two identical coaxial circular loops carry a current i each circulating in the same direction. If the loops approach each other, you will observe that the current in
(a) each increases
(b) each decreases
(c) each remains the same
(d) one increases whereas that in the other decreases

Answer

Q.16. When current in a coil changes from 5 A to 2 A in 0.1 s, average voltage of 50 V is produced. The self-inductance of the coil is
(a) 1.67 H
(b) 6 H
(c) 3 H
(d) 0.67 H

Answer

Q.17. The self inductance associated with a coil is independent of
(a) current
(b) induced voltage
(c) time
(d) resistance of a coil

Answer

Q.18. A coil having 500 sq. loops of side 10 cm is placed normal to magnetic flux which increases at a rate of 1 T/s. The induced emf is
(a) 0.1 V
(b) 0.5 V
(c) 1 V
(d) 5 V

Answer

Q.19. A coil of 100 turns carries a current of 5 mA and creates a magnetic flux of 10^{-5} weber. The inductance is
(a) 0.2 mH
(b) 2.0 mH
(c) 0.02 mH
(d) 0.002 H

Answer

Q.20. The north pole of a long bar magnet was pushed slowly into a short solenoid connected to a short galvanometer. The magnet was held stationary for a few seconds with the north pole in the middle of the solenoid and then withdrawn rapidly. The maximum deflection of the galvanometer was observed when the magnet was

(a) moving towards the solenoid
(b) moving into the solenoid
(c) at rest inside the solenoid
(d) moving out of the solenoid

Answer

Q.21. The current flows from A to B is as shown in the figure. The direction of the induced current in the loop is

(a) clockwise.
(b) anticlockwise.
(c) straight line.
(d) no induced e.m.f. produced.

Answer

Q.22. In a coil of self-induction 5 H, the rate of change of current is 2 As^{-1}. Then emf induced in the coil is

(a) 10 V
(b) -10 V
(c) 5 V
(d) -5 V

Answer

Q.23. The magnetic flux linked with a coil of N turns of area of cross section A held with its plane parallel to the field B is

$(a)\ \frac{NAB}{2}$ $(b)\ NAB$ $(c)\ \frac{NAB}{4}$ (d) zero

Answer

Q.24. Two identical coaxial coils P and Q carrying equal amount of current in the same direction are brought nearer. The current in

(a) P increases while in Q decreases
(b) Q increases while in P decreases
(c) both P and Q increases
(d) both P and Q decreases

Answer

Q.25. Faraday's laws are consequence of the conservation of

(a) charge
(b) energy
(c) magnetic field
(d) both (b) and (c)

Answer

Q.26. Direction of current induced in a wire moving in a magnetic field is found using

(a) Fleming's left hand rule
(b) Fleming's right hand rule
(c) Ampere's rule
(d) Right hand clasp rule

Answer

Q.27. Which of the following statements is not correct?

(a) Whenever the amount of magnetic flux linked with a circuit changes, an emf is induced in circuit.
(b) The induced emf lasts so long as the change in magnetic flux continues.
(c) The direction of induced emf is given by Lenz's law.
(d) Lenz's law is a consequence of the law of conservation of momentum.

Answer

Q.28. Lenz's law is a consequence of the law of conservation of

(a) charge

(b) energy
(c) induced emf
(d) induced current

Answer

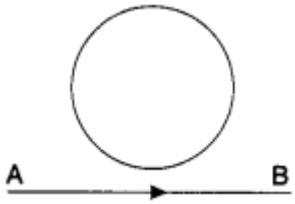
Q.29. A solenoid is connected to a battery so that a steady current flows through it. If an iron core is inserted into the solenoid, the current will
(a) increase
(b) decrease
(c) remain same
(d) first increase then decrease

Answer

Q.30. There is a uniform magnetic field directed perpendicular and into the plane of the paper. An irregular shaped conducting loop is slowly changing into a circular loop in the plane of the paper. Then
(a) current is induced in the loop in the anti-clockwise direction.
(b) current is induced in the loop in the clockwise direction.
(c) ac is induced in the loop.
(d) no current is induced in the loop.

Answer

Q.31. In the given figure current from A to B in the straight wire is decreasing. The direction of induced current in the loop is A



(a) clockwise
(b) anticlockwise
(c) changing
(d) nothing can be said

Answer

Q.32. Which of the following does not use the application of eddy current?
(a) Electric power meters
(b) Induction furnace
(c) LED lights
(d) Magnetic brakes in trains

Answer

Q.33. The north pole of a bar magnet is rapidly introduced into a solenoid at one end (say A). Which of the following statements correctly depicts the phenomenon taking place?
(a) No induced emf is developed.
(b) The end A of the solenoid behaves like a south pole.
(c) The end A of the solenoid behaves like north pole.
(d) The end A of the solenoid acquires positive potential.

Answer

Q.34. A metal plate can be heated by
(a) passing either a direct or alternating current through the plate.
(b) placing in a time varying magnetic field.
(c) placing in a space varying magnetic field, but does not vary with time.
(d) both (a) and (b) are correct.

Answer

Q.35. Identify the wrong statement.
(a) Eddy currents are produced in a steady magnetic field.
(b) Eddy currents can be minimized by using laminated core.
(c) Induction furnace uses eddy current to produce heat.
(d) Eddy current can be used to produce braking force in moving trains.

Answer

Q.36. If number of turns in primary and secondary coils is increased to two times each, the mutual inductance
(a) becomes 4 times
(b) becomes 2 times
(c) becomes A times
(d) remains unchanged 4

Answer

Q.37. When the rate of change of current is unity, the induced emf is equal to
(a) thickness of coil
(b) number of turns in coil
(c) coefficient of self inductance
(d) total flux linked with coil

Answer

Q.38. Two inductors of inductance .L each are connected in series with opposite? magnetic fluxes. The resultant inductance is (Ignore mutual inductance)
(a) zero
(b) L
(c) 2L
(d) 3L

Answer

Q.39. A square of side L metres lies in the x-y plane in a region, where the magnetic field is given by B = B_0{li + 3j + 4k) T, where Bo is constant. The magnitude of flux passing through the square is [NCERT Exemplar]
(a) $2B_oL^2$ Wb.
(b) $3B_oL^2$ Wb.
(c) $4B_oL^2$ Wb.
(d) √29 B_oL^2 Wb.

Answer

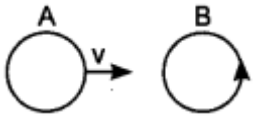
Q.40. A loop, made of straight edges has six comers at A(0, 0, 0), B(L, 0, 0) C(L, L, 0), D(0, L, 0), E(0, L, L) and F(0,0, L). A magnetic field B = B_o (*i*+*k*)T is present in the region. The flux passing through the loop ABCDEFA (in that order) is [NCERT Exemplar]
(a) B_oL^2 Wb.
(b) $2B_oL^2$ Wb.
(c) √$2B_oL^2$ Wb.
(d) $4B_oL^2$ Wb.

Answer

Q.41. An e.m.f is produced in a coil, which is not connected to an external voltage source. This is not due to
(a) the coil being in a time varying magnetic field.
(b) the coil moving in a time varying magnetic field.
(c) the coil moving in a constant magnetic field.
(d) the coil is stationary in external spatially varying magnetic field, which does not change with time.

Answer

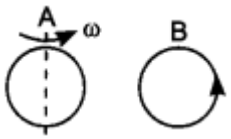
Q.42. There are two coils A and B as shown in Figure. A current starts flowing in B as shown, when A is moved towards B and stops when A stops moving. The current in A is counterclockwise. B is kept stationary when A moves. We can infer that [NCERT Exemplar]



(a) there is a constant current in the clockwise direction in A.
(b) there is a varying current in A.
(c) there is no current in A.
(d) there is a constant current in the counterclockwise direction in A.

Answer

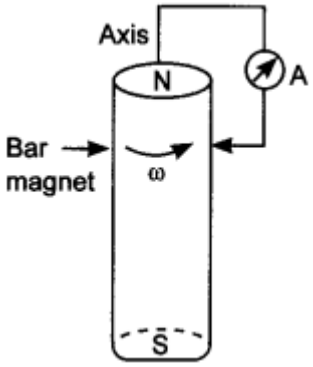
Q.43. Same as question 4 except the coil A is made to rotate about a vertical axis (Figure). No current flows in B if A is at rest. The current in coil A, when the current in B (at t = 0) is counterclockwise and the coil A is as shown at this instant, t = 0, is [NCERT Exemplar]



(a) constant current clockwise.
(b) varying current clockwise.
(c) varying current counterclockwise.
(d) constant current counterclockwise.

Answer

Q.44. A cylindrical bar magnet is rotated about its axis (Figure). A wire is connected from the axis and is made to touch the cylindrical surface through a contact. Then [NCERT Exemplar]



(a) a direct current flows in the ammeter A.
(b) no current flows through the ammeter A.
(c) an alternating sinusoidal current flows through the ammeter A with a time period $T = 2\pi\omega$
(d) a time varying non-sinosoidal current flows through the ammeter.

Answer

Q.45. Eddy currents do not cause
(a) damping
(b) heating
(c) sparking
(d) loss of energy

Answer