INDUS RANGERS INSTITUTE PVT. LTD
ELECTROMAGNETIC INDUCTANCE

1.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 the above

2.Lenz's law is a consequence for the law of conservation of
(a)charge (b)current
(c)momentum (d)energy

3.According to Faraday's law of electromagnetic induction
(a)the direction of induced current is such that it oppose the cause producing it
(b)the magnitude of induced emf produced in a coil is directly proportional to the rate of change of magnetic flux
(c)the direction of induced emf is such that it oppose the cause producing it
(d)none of the above

4.An induced emf is produced when a magnet is plunged into a coil. The magnitude of the induced emf is independent of
(a)the strength of the magnet
(b)the speed with which the magnet is moved
(c)the resistivity of the wire of the coil
(d)the number of turns in the coil

5.Two identical coaxial circular loops carry a current in each circulating in the same direction. If the loops approach each other the current in
(a)each decrease
(b)each increase
(c)each remains the same
(d)First more and then less that due to gravity

6.If the magnetic flux linked with a coil varies at the rate of 1 Wb/min, the induced emf is
(a)1 V (b)1/60 V (c)60 V
(d)none of the above

7.A magnet is moving towards a coil along its axis and the emf induced in the coil is ε.If the coil also starts moving towards the magnet with the same speed, the induced emf will be
(a)$\varepsilon/2$ (b)ε (c)2 ε (d)4ε

8.A rectangular coil of 100 turns and size 0.1 m x 0.05 m is placed perpendicular to magnetic field of 0.1 T.If the field drops to 0.05 T in 0.05 s ,the magnetic of the emf induced in the coil is
(a)0.5V (b)0.75V (c)1.0V (d)0.02 v

9.A wire of length 1.0 m moves with a speed of 10m/s perpendicular to magnetic field. If the emf induced in the wire is 1.0 V, the magnetic of the field is
(a)0.01T (b)0.1T (c)0.2T (d)0.02T

10.A copper rod of length l is rotated about one end perpendicular to magnetic field B with constant angular velocity ω.The induced emf between the two ends is
(a)$\frac{1}{2}$Bωl^2 (b)$\frac{3}{4}$Bωl^2 (c)Bωl^2 (d)2 Bωl^2

11.A metal conductor of length 1 m rotates vertically about one of its ends at angular velocity 5 radians of per second .If the horizontal component of earth's magnetic field is 0.2 x 10^{-4} T, then the emf developed between the two ends of the conductor is
(a)5 m V (b)5 x 10^{-4}V
(c)50 m V (d)50μV

12.A coil having 500 square loops ,each of side 10 cm is placed normal to magnetic field which is increasing at the rate of 1.0 tesla per second .The induced emf is
(a)0.1V (b)0.5 V (c)1V (d5V

13.A cylindrical are magnet is kept along the axis of a circular coil. If the magnet is rotated about its axis, then
(a)a current will be induced in the coil
(b)no current will be induced in the coil
(c)only an emf will be induced in the coil
(d)both a current and an emf will be induced in the coil

14. The current in a coil changes from 0 to 2 A in 0.05s .If the induced emf is 80 V, the self-inductance of the coil is
(a)1H (b)0.5 H (c)1.5 H (d)2 H

15.A coil is rotated in a uniform magnetic field about an axis coil would be maximum when the plane of the coil is
(a)parallel to the field
(b)perpendicular to the field
(c)at 45° to the field
(d)in none of the above positions

16. The mutual inductance of a pair of coils is 2 H. If the current in one of the coil changes from 10 A to zero in 0.1 s, the emf induced in the other coil is
(a)2 V (b)20 V (c)0.2 V (d)200V

17. The time taken by the current to rise to 0.63 of its maximum value in a d.c circuit containing inductance(L) and resistance(R)depends on
(a)L only (b)R only (c)L/R (d)L/R

18. If L and R denote inductance and resistance ,the dimensional formula for L/R is
(a)$M^0L^0T^0$ (b)M^0L^0T
(c)MLT^2 (d)$M^2L^0T^2$

19. Two inductors, each of inductance L, are connected in parallel but are well separated from each other. The effective inductance is
(a)L/4 (b)L/2 (c)L (d)2L

20. Two coils of inductance L_1 *and* L_2 are placed so close together that the same flux is linked with both. The mutual inductance of the pair is
(a)L_1L_2 (b)$(L_1L_2)^2$
(c)$\sqrt{L_1L_2}$ (d)none of the above

21.A wire loop is rotated in a uniform magnetic field about an axis perpendicular to the field. The direction of the current induced in the loop reverse once each
(a)quarter revolution
(b)half revolution
(c)full revolution
(d)two revolutions

22. Two different wire loops are concentric and lie in the same plane. The current in the outer loop is clockwise and increasing with time. The induced current in the inner loop then is
(a)clockwise (b)zero
(c)counter clockwise (d)in a direction that depends on the ratio of the loop radii

23. Eddy currents are produced in a material when it is
(a)heated
(b)placed in a time varying magnetic field
(c)placed in an electric field
(d)placed in a uniform magnetic field

24. An emf of 5 V in induced in an inductance when the current in it changes at a steady rate from 3 A to 2 A in 1 milliseconds. The value of the inductance is
(a)5 mH (b)5 H (c)5000H (d)zero

25. Faraday's law of electromagnetic induction is related to the
(a)law of conservation of charge
(b)law of conservation of energy

(c)third of law of motion
(d)law of conservation of angular momentum

26. The inductance of a coil is proportional to
(a)its length
(b)the number of turns
(c)the resistance of the coil
(d)the square of the number of turns

27. When the current in a coil changes from 2 A to 4 A in 0.05 s, an emf of 8 V is induced in the coil .The coefficient of self-induction of the coil is
(a)0.1H (b)0.2H (c)0.4H (d)0.8H

28.A.C power is transmitted from a power house at a high voltage as
(a)the rate of transmission is faster at high voltages
(b)it is more economical due to less power loss
(c)power cannot be transmitted at low voltages
(d)a precaution against theft of transmission lines

29.The direction of inducted emf during electromagnetic induction is given by
(a)Faraday's law (b)Lenz's law
(c)Maxwell's law (d)Ampere's law

30. To induce an emf in a coil ,the linking magnetic flux
(a)must decrease
(b)must increase
(c)must remains constant
(d)can either increase or decrease