MODERN SCIENCE ACADEMY

15. "ELECTROMAGNETISM"

Sr.	Statements	A	B	C	D
1	Which statement is true about the magnetic poles?	unlike poles repel	like poles attract	poles don't affect each other	a single pole does not exist
2	What is the direction of the magnetic field inside a bar magnet?	from north pole to south pole	from south pole to north pole	from side to side	no magnetic field lines
3	The presence of a magnetic field can be detected by:	small mass	stationary positive charge	stationary negative charge	magnetic compass
4	If the current in wire which is placed perpendicular to a magnetic field increases, the force on the wire:	increases	decreases	remains the same	will be zero
5	A D.C. motor converts energy:	mechanical into electrical	electrical into mechanical	mechanical into chemical	electrical into chemical
6	Which part of D.C. motor reverses the direction of current through every half-cycle?	armature	commutator	brushes	slip rings
7	The direction of induced e.m.f. in a circuit in a circuit is in accordance with conservation of:	mass	charge	momentum	energy
8	The step up transformer:	increases the input current	increases the input voltage	has more turns in the primary	has less turns in secondary
9	The turn ratio of a transformer is 10, it means:	$I_s = 10\ I_p$	$N_s=\frac{Np}{10}$	$N_s = 10\ N_p$	$V_s = \frac{Vp}{10}$
10	According to Right Hand Grip rule, current will be in the direction of:	curling fingers	forefinger	thumb	opposite to thumb
11	Total force on the armature can be increased by increasing:	number of turns on coil	current in the coil	area of the coil	all of these
12	In D.C. motor, coil can rotate in a magnetic field by an angle of:	90°	60°	45°	30°
13	Which device is based on the principle of electromagnetism?	electric motor	T.V.	CDs	mobile phones
14	Laws of electromagnetic induction and electrolysis were presented by:	George Simon Ohm	Charles Coulomb	Joseph Henry	Michael Faraday
15	The number of magnetic lines of force will be maximum when surface is held ___ to the magnetic lines of force.	parallel	perpendicular	anti-parallel	none
16	The production of induced current in a coil due to change of current in neighboring coil:	mutual induction	self induction	electromagnetic induction	both A & B
17	Transformer is used to change the value of:	charge	energy	power	voltage
18	Mutual induction works in:	transformer	transistor	A.C. generator	D.C. motor
19	Formula for ideal transformer:	$V_pV_s=I_pI_s$	$V_pI_s=V_sI_p$	$V_pI_p=V_sI_s$	none
20	Transformer is called step down when:	$V_s > V_p$	$V_s > N_s$	$V_p > V_s$	$V_p > N_s$
21	Transformer used on power station is:	step-up	step-down	ideal	none
22	If magnetic field in conductor, passing perpendicularly through cardboard, is anticlockwise then direction of current in it due to free electrons is:	out of page	into the page	upward	downward
23	According to Right hand palm rule, fingers indicate:	conventional current	emg	magnetic field	magnetic force
24	A conductor is placed horizontally, direction of current in it is in east, magnetic field is out of page, perpendicular to conductor. What is the direction of magnetic force on the conductor?	east	west	south	north
25	Direction of magnetic field inside permanent bar magnet is:	from north to south	from south to north	from east to south	from west to north

26	Which of these parts is responsible for DC motor coil to rotate in one direction?	load	slipn rings	commutators	battery
27	If a coil moves parallel to a uniform magnetic field, the induced emf will be:	maximum	zero	negative	positive
28	The device which converts mechanical energy into electrical energy:	motor	generator	thermocouple	battery
29	Step-up transformer increases:	current	power	energy	voltage
30	What is output of step-up transformer having turns ratio 1:50, if 50 V DC is applied at its primary coil?	2500 V	1 V	zero	100 V
31	If magnet is moved towards coil with uniform acceleration, magnitude of induced emf in the coil:	increases	decreases	remains same	is zero
32	A transformer has 100 turns in the primary coil and 500 turns in the secondary coil. If 6 V is applied across its primary, the voltage induced across its secondary would be:	0 volts	30 volts	45 volts	60 volts
33	A current carrying wire in which current flow in northward direction is deflected towards east by magnetic force. The direction of magnetic field is:	straight up	straight down	south	west
34	Which derived unit is equivalent to tesla (T) ?	Nm/A	NA/m	N/Am	Am/N
35	The unit of inductance, henry, is equivalent to:	Vs/A	VA/m	As/V	V/A
36	When the speed at which a magnet is moved through a coil is increased, the induced voltage:	increases	remains the same	decreases	goes to zero
37	Slip rings are part of:	DC motor	AC generator	transformer	magnet
38	A transformer is used for:	both AC and DC	AC voltages	DC voltages	farming

"Important Short Questions"

1) Define electromagnetism and magnetic flux.
2) Differentiate between electric and magnetic fields.
3) Where magnetic field is produced in our body? How it is detected?
4) Demonstrate by an experiment that a magnetic field is produced around a straight current carrying conductor?
5) State right hand grip rule. Also draw diagram.
6) Two parallel straight conductors carrying current in same direction, attract each other? Explain why. What will you conclude if direction of current if direction of current in conductors is opposite?
7) Bar magnets are dropped in long pipes made up of plastic and copper (of same length) simultaneously. Bar magnet comes out later through copper pipe than through plastic pipe, why?
8) Can an electron at rest be set into motion with a magnetic field?
9) What is meant by solenoid? State right hand rule to find the direction of its magnetic field.
10) Which is more likely to show deflection in compass needle, AC current or DC current? Explain.
11) What is electromagnet? Briefly explain RELAY.
12) State Fleming's left hand rule. Also write the factors on which magnetic force acting on conductor depends.
13) A constant magnetic field is applied to a current carrying conductor. What angle should the wire make with the field for the force due to be (a) maximum (b) minimum?
14) Write factors on which torque acting on a current carrying coil depends.
15) How information is obtained from bank credit card?
16) What is electromagnetic induction? Demonstrate it by simple experiment.
17) State Faraday's law of electromagnetic induction. Write factors affecting induced e.m.f.
18) Describe the direction of an induced e.m.f. in a circuit. How does this phenomenon relate with law of conservation of energy?

19) A bar magnet is moving the ring, what is direction of induced current in the ring when:
    a. Magnet is moving towards the ring
    b. Magnet is moving away from the ring
20) How can a magnetic field be used to generate electric current?
21) What would happen if we use a slip ring to drive a DC motor?
22) What is the basic principle of A.C. generator?
23) Write three differences between generator and motor?
24) What is mutual induction? What is its S.I. unit?
25) State two reasons why electric power is transmitted at high voltage.
26) A conductor wire generates a voltage while moving through a magnetic field. In what direction should the wire be moved, relative to field to generate the maximum voltage?
27) Differentiate step-up and step-down transformer.
28) Can a transformer operate on direct current? Explain.
29) Why are coils of transformer wound on iron core?
30) When you are pushing a bar magnet towards the coil of single turn, you feel an opposing force on your hand. If this magnet is pushed towards coil of many turns, now you will feel greater opposing force. Why?
31) In what way split rings (commutators) in DC motor differ from slip rings in AC motor in working?

"Important Long Questions"

1) What is D.C. motor? Explain its construction and working principle.
2) What is A.C. generator? Explain its construction and working principle.
3) What is transformer? Explain its construction, types and working principle. Also derive formula for ideal transformer.