

MAGNETIC EFFECTS OF ELECTRIC CURRENT

Q.1) The direction of magnetic lines of force produced by passing a direct current in a conductor is:

- (A) Perpendicular to the conductor and coming outward
- (B) Perpendicular to the conductor and going inward
- (C) parallel to conductor
- (D) surrounding the conductor and of circular nature

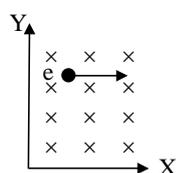
Q.2) The magnetic induction at a point P which is distant 4 cm from a long current carrying wire is 10^{-3} tesla. The field of induction at a distance 12 cm from the same current would be:

- (A) 3.33×10^{-4} T
- (B) 1.11×10^{-4} T
- (C) 3×10^{-3} T
- (D) 9×10^{-3} T

Q.3) Two long parallel wires carry equal current I in the same direction. The length of each wire is l and the distance between them is d . Force acting per unit length on each wire is:

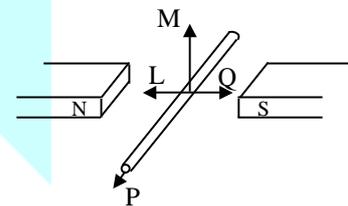
- (A) $\frac{\mu_0 I^2}{2\pi d}$
- (B) $\frac{\mu_0 I^2}{4\pi d}$
- (C) $\frac{\mu_0 I}{2\pi d}$
- (D) $\frac{\mu_0 I}{4\pi d}$

Q.4) In the given figure the electron enters into the magnetic field. It deflects in direction:



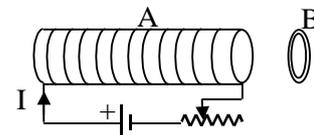
- (A) positive x -direction
- (B) negative x -direction
- (C) positive y -direction
- (D) negative y -direction

Q.5) An electric potential difference will be induced between the ends of the conductor shown in the figure when the conductor moves in the direction



- (A) P
- (B) Q
- (C) L
- (D) M

Q.6) An aluminium ring B faces an electromagnet A. Which of the following statements is correct?



- (A) (A) If I increases, A will repel B
- (B) (B) If I decreases, A will repel B
- (C) If I increases, A will attract B
- (D) Whether I increases or decreases, B will not experience any force

Q.7) Two different loops are concentric and lie in the same plane. The current in the outer loop is clockwise and increases with time. The induced current in the inner loop then is:

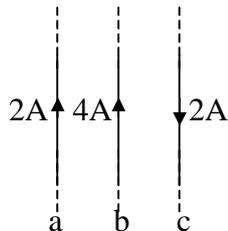
- (A) Clockwise
- (B) zero
- (C) counterclockwise

- (D) in a direction that depends in the ratio of the loop radii
- Q.8)** A horizontal straight conductor (otherwise placed in a closed circuit) along east-west direction falls under gravity; then there is:
- (A) no induced e.m.f. along the length
(B) an induced emf across the length
(C) an induced current from west to east
(D) an induced current from the east to west
- Q.9)** A car moves on a plane road. Induced e.m.f. produced across the axle is maximum when it moves:
- (A) at the poles
(B) move at equator
(C) remains stationary
(D) no e.m.f. is induced at all
- Q.10)** Induced emf in the coil depends upon
- (A) conductivity of coil
(B) amount of flux
(C) rate of change of linked flux
(D) resistance of coil
- Q.11)** The net magnetic flux through any closed surface, kept in a magnetic field is
- (A) zero (B) $\mu_0/4\pi$
(C) $4\pi\mu_0$ (D) $4\mu_0/\pi$
- Q.12)** The armature current in a DC motor is maximum when the motor has:
- (A) picked up maximum speed
(B) just started
(C) intermediate speed
(D) just been switched off
- Q.13)** Fleming's left and right hand rules are used in
- (A) DC motor and AC generator
(B) DC generator and AC motor
(C) DC motor and DC generator
(D) AC motor and AC generator
- Q.14)** The magnetic field due to a current element is independent of
- (A) current through it
(B) distance from it
(C) its length
(D) none of the above
- Q.15)** The strength of the magnetic field around an infinite current carrying conductor is
- (A) same every where
(B) inversely proportional to the distance
(C) inversely proportional to the square of the distance
(D) directly proportional to the distance
- Q.16)** A charge is fired through a magnetic field. The force acting on it is maximum when the angle between the direction of motion and magnetic field is
- (A) zero (B) $\pi/4$
(C) $\pi/2$ (D) π
- Q.17)** What happens between the two streams of electrons moving parallel to each other in the same direction?
- (A) Attract each other
(B) Repel each other
(C) Cancel the electric field of each other
(D) Cancel the magnetic field of each other
- Q.18)** The strength of the magnetic field at a point distance 10 cm from a long straight current carrying wire is B. The field at a distance 5 cm will be

(A) $B/4$ (B) $B/2$

(C) $2B$ (D) $4B$

Q.19) Figure shows three parallel wires carrying currents as shown. The force on the wire b is



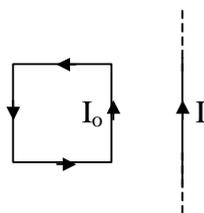
(A) towards c

(B) towards a

(C) zero

(D) perpendicular to current

Q.20) A rectangular loop carries a current I_0 . It is placed near a long straight conductor carrying current I as shown in figure. What will be the nature of the force experienced by the coil?



(A) no force

(B) repulsion

(C) attraction

(D) it will experience a torque

Q.21) A small piece of substance is repelled by a strong permanent magnet. The substance is

(A) diamagnetic (B) paramagnetic

(C) ferromagnetic (D) ferrite

Q.22) If the magnetic field is parallel to a surface, then the magnetic flux through the surface is

(A) zero (B) small but not zero

(C) infinite (D) large but not infinite

Q.23) Which of the following gives the direction of the induction emf?

(A) Faraday's laws (B) Lenz's law

(C) Ampere's theorem (D) Biot Savart law

Q.24) Which of the following is based on the law of conservation of energy?

(A) emf

(B) electric current

(C) magnetic field

(D) none of the above

Q.25) Dynamo is designed on the principle of

(A) electromagnetic induction

(B) self induction

(C) mutual induction

(D) none of the above

Q.26) The force between two current carrying parallel wires is due to

(A) electrostatic interaction

(B) magnetic effect of electric current

(C) electric effect of magnetic field

(D) electromagnetic induction

Q.27) Which of the following is used to determine the direction of induced current in a generator?

(A) Fleming's left hand rule

(B) Fleming's right hand rule

(C) Maxwell's cork screw rule

(D) Ampere's swimming rule

Q.28) The current from which of the following devices does not vary in magnitude?

(A) Transformers (B) Dynamo

(C) Cell

(D) Induction coil

Q.29) Which of the following is NOT a factor to

determine the mutual inductance of the two coils?

- (A) the number of turns of each coil
- (B) The shape of each coil
- (C) current through each coil
- (D) separation between the coils

Q.30) In which of the following cases with a bar magnet and the solenoid no induced emf is produced?

- (A) when magnet is inserted
- (B) when magnet is withdrawn
- (C) when coil moved towards or away from the magnet
- (D) when the relative velocity of the coil with respect to the magnet is zero

Answer Sheet

Q.1	D	Q.11	A	Q.21	A
Q.2	A	Q.12	B	Q.22	A
Q.3	A	Q.13	C	Q.23	B
Q.4	D	Q.14	D	Q.24	A
Q.5	D	Q.15	B	Q.25	A
Q.6	C	Q.16	C	Q.26	B
Q.7	C	Q.17	B	Q.27	B
Q.8	C	Q.18	C	Q.28	C
Q.9	A	Q.19	B	Q.29	C
Q.10	C	Q.20	C	Q.30	D