EXERCISE - 1

A Very Short Answer Type Questions

- Q.1 When can an electric charge give rise to a magnetic field ?
- **Q.2** Draw a diagram showing the magnetic field lines due to a current–carrying straight wire.
- Q.3 Name the law which determines the direction of magnetic field round a current–carrying solenoid.
- Q.4 Name the rule by which the direction of a magnetic field inside a current–carrying solenoid is determined.
- **Q.5** Draw a diagram of an electromagnet. How is the polarity of the ends determined by the diagram?
- **Q.6** State two ways by which the strength of an electromagnet can be increased.
- **Q.7** Differentiate between an electromagnet and a permanent magnet.
- **Q.8** Which law determines the direction of force on a current–carrying conductor placed in a magnetic field ?
- **Q.9** How will the direction of force be changed, if the current is reversed in the conductor placed in a magnetic field ?
- **Q.10** Give the unit of intensity of magnetic field.
- Q.11 On one face of a solenoid the current is clockwise, when looked towards it. The particular face will act as a-north pole or south pole ?
- Q.12 State two factors on which the magnitude and direction of an induced emf depends.
- Q.13 A bar magnet is moved with the north pole towards a coil. At this face of the coil the

induced current will be clockwise or anticlockwise?

- Q.14 What will be the effect on the magnitude of induced current if the magnet moves faster towards the coil ?
- Q.15 On what principle does an electric motor work ?
- **Q.16** On what principle does the working of a generator depend ?
- Q.17 What type of energy conversion takes place in an electric motor ?
- Q.18 What type of energy conversion takes place in a generator ?
- Q.19 State two characteristics of a fuse wire.
- **Q.20** Does a fuse wire have low resistance or high resistance ?
- **Q.21** Fuse wire should be made up to a material of low melting point. Why ?
- Q.22 Why is a fuse wire fitted in a porcelain case ?
- **Q.23** A fuse wire is connected to a live–wire or a neutral wire ?
- Q.24 Why are the switches put in the live wire ?
- **Q.25** Which of the cables-rated 5A and the other-15 A-will be thicker ?
- Q.26 Name the place on earth where a freely suspended magnetic needle will stay (i) horizontal (ii) vertical

B Short Answer Type Questions

Q.27 What is the shape of the magnetic field lines due to current–carrying straight conductor ?

- Q.28 State a law which determines the direction of magnetic field around a current–carrying wire.
- Q.29 If a wire is bent into a circle, current flows in an anticlockwise direction. What polarity does this face of the coil exhibit ?
- Q.30 What is the direction of magnetic field at the centre of a current carrying coil if the current is in (i) anticlockwise direction (ii) clockwise direction.
- **Q.31** A freely suspended current–carrying solenoid rests along a particular direction. Explain.
- Q.32 A magnetic compass is brought near a current–carrying solenoid. What will be the effect on the compass needle ?
- **Q.33** How is the direction of magnetic field determined inside a current–carrying solenoid ?
- Q.34 State any three uses of an electromagnet.
- Q.35 State two advantages of an electromagnet over a permanent magnet.
- **Q.36** Differentiate between an electromagnet and a permanent magnet.
- Q.37 Define electromagnetic induction.
- **Q.38** What kind of energy change takes place when a magnet is moved towards a coil having a galvanometer connected to its ends ?
- Q.39 What is the use of commutator in a DC motor?

C Long Answer Type Questions

- Q.40 What do you mean by a natural magnet ? Define a loadstone. Describe its main properties.
- Q.41 Take a bar magnet and a compass needle. Draw a diagram for the magnetic field lines.

- Q.42 Describe an experiment to demonstrate that a current–carrying conductor produces a magnetic field around it.
- **Q.43** Draw a diagram to show the magnetic field lines due to a current–carrying straight wire.
- Q.44 Draw a diagram to show the set up of a current-carrying loop producing magnetic field and show the direction of the magnetic field.
- Q.45 Describe an experiment to show that a magnetic field exerts a force on a current–carrying conductor.
- Q.46 Describe Fleming's left–hand rule.
- **Q.47** How is an electromagnet made ? Give the principle of an electromagnet. How will you determine the polarities ?
- Q.48 Explain Fleming's right-hand rule.
- **Q.49** Describe the construction and working of an electric motor with the help of a diagram.
- **Q.50** Describe with a well–labeled diagram, the construction and working of an AC generator.
- **Q.51** Describe the construction and working of a DC generator.
- Q.52 Define live, neutral and earth wires.
- **Q.53** Describe the use of an electric fuse. How are electric fuses of different ratings are used ?
- **Q.54** What do you mean by short circuit and overloading ? How does an electric fuse help in both the cases ?
- Q.55 You are required to make an electromagnet from a soft iron bar. Draw a circuit diagram using a cell, an insulated copper coil and a soft iron bar.

EXERCISE - 2

Single Correct Answer Type Questions

- Q.1 When a bar magnet is broken into two pieces-
 - (A) we will have a single pole on each piece
 - (B) each piece will have two unlike poles
 - (C) each piece will have two like poles
 - (D) none of these
- Q.2 The magnetic field intensity produced due to a current carrying coil is maximum at-
 - (A) any point
 - (B) the centre of the coil
 - (C) any point lying on the axis of the coil
 - (D) points lying between centre of the coil and its circumference
- Q.3 The direction of magnetic lines of force produced by passing a direct current in a conductor is-
 - (A) perpendicular to the conductor and coming outwards
 - (B) parallel to conductor
 - (C) surrounding the conductor and of circular nature
 - (D) perpendicular to the conductor & coming inwards
- Q.4 Which of the following datermine the direction of magnetic field due to a current carrying conductor ?
 - (A) Faraday's laws of electromagnetic induction
 - (B) Fleming's left-hand rule
 - (C) Lenz's law
 - (D) Maxwell's cork screw rule
- Q.5 In the figure QR is a vertical conductor and the current I flows R to Q. P is point on the

horizontal plane and is to the south of the wire. The direction of the magnetic field at P due to the current will be towards –



- Q.6 A length of wire carries steady current. It is bent first to form a circular plane coil of one turn. The same length is now bent to give a double loop of smaller radius. The magnetic field produced at the centre by the same current will be-
 - (A) a quarter of its first value
 - (B) a half of first value
 - (C) four times its first value
 - (D) unaltered
- **Q.7** A wire as shown in figure carriers a current I ampere. The semicircle has a radius *r*. The magnetic field at the centre C will be-



(A) zero

- (B) $\frac{\pi I}{r} \times 10^{-7}$ Newton/ampere-meter
- (C) $\frac{\pi I}{r}$ Newton/ampere-meter

(D)
$$\frac{\pi I}{r}$$
 gauss

- **Q.8** The intensity of a magnetic field is defined as the force experienced by a-
 - (A) standard compass
 - (B) unit positive charge
 - (C) unit negative charge
 - (D) unit north pole
- Q.9 A wire carrying a current of 5A is placed perpendicular to a magnetic induction of 2T. The force on each centimeter of the wire is (A) 1N (B) 100N
 (C) 0.1 N (D) 10 N
- Q.10 If a soft iron piece is buried under the surface of earth in the north and south direction, then-(A) it will acquire the properties of a magnet (B) its properties will not change (C) it will behave like an insulator
 - (D) can't say with surity
- Q.11 Force acting on a stationary charge Q in the magnetic field B is-(A)BQV (B) BV/Q (C) Zero (D) BQ/V
- **Q.12** A proton is moving with velocity 10^4 m/s parallel to the magnetic field of intensity S tesla. The force on the proton is -(A) 8×10^{-15} N (B) 10^4 N (C) 1.6×10^{-19} N (D) Zero
- Q.13 A wire of length l is placed in a magnetic field B, If the current in the wire is I, then maximum magnetic force on the wire is -

(A) $BI\ell$	(B) $\frac{B}{I\ell}$
(C) $\frac{I\ell}{B}$	(D) $\frac{I}{B\ell}$

- Q.14 The permanent magnets are kept with soft iron pieces at ends as keepers :
 - (A) to magnetise the soft iron pieces

- (B) to increase the strength of the magnets
- (C) to avoid self demagnetisation
- (D) for physical safety of the magnets
- Q.15 Which of the following statement is not correct about two parallel conductors carrying equal currents in the same direction ?
 - (A) Each of the conductors will experience a force
 - (B) The two conductors will repel each other
 - (C) there are concentric lines of force around each conductor.
 - (D) Each of the conductors will move if not prevented from doing so.
- **Q.16** Lenz's law is a consequence of the law of conservation of:
 - (A) energy
 - (B) momentum
 - (C) angular momentum
 - (D) charge and mass
- Q.17 The induced emf produced when a magnet is inserted into a coil does not depend upon:(A) the number of turns in the coil
 - (B) the resistance of the coil
 - (C) the magnetic moment of the magnet
 - (D) the speed of approach of the magnet
- Q.18 Lenz's law:
 - (A) is the same as the right hand palm rule

(B) determines the magnitude of an induced e.m.f.

(C) bears no relation to the law of conservation of energy

(D) is useful in deciding about the direction of an induced e.m.f.

- Q.19 When the current through a solenoid increases at a constant rate, the induced current:
 - (A) is a constant and in the direction of inducing current

- (B) is a constant and is opposite to the direction of inducing current
- (C) increases with time and is in the direction of inducing current
- (D) increases with time and is opposite to the direction of inducing current
- Q.20 A.C. used in our domestic consumption has a frequency-

(A) 60 Hz	(C) 50 Hz
(C) 30 Hz	(D) 100 Hz

- Q.21 A solenoid having an iron core has its terminals connected across an ideal D.C. source. If the iron core is removed the current flowing through solenoid:
 - (A) increases
 - (B) decreases
 - (C) remains unchanged
 - (D) nothing can be said
- Q.22 Current is induced in a coil by electromagnetic induction when

- (A) Only the coil moves in a magnetic field
- (B) Only the magnetic is moved into a coil
- (C) Coil and the magnet move with respect to each other
- (D) None of the above
- Q.23 AC is preferred because -
 - (A) it is cheap
 - (B) it is easily reproducible
 - (C) it is economical in transmission
 - (D) it is not dangerous
- Q.24 A cylindrical bar 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 emf will be induced in the coil
 - (D) an emf and current both will be induced in the coil

ANSWER KEY

Ques	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	В	В	С	D	С	С	В	D	С	А	С	D	Α	С	В
Ques	16	17	18	19	20	21	22	23	24						
Ans	А	В	D	В	В	А	С	С	В						

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