14.1 MAGNETIC FIELD DUE TO CURRENT IN LONG CONDUCTOR

1. **Electric current produces magnetic field was suggested by**

(a) Faraday (b) Oersted (c) Henry (d) Lenz

2. **The shape of magnetic field around a long straight current carrying wire is**

(a) Elliptical (b) Square (c) Rectangular (d) Circular

3. **The direction of magnetic field due to current carrying conductor can be determined by**

(a) Right Hand Rule (b) Left Hand Rule (c) Fleming Left Hand Rule

MCQ # 2: (d)	MCQ # 1: (b)	MCQ # 3: (a)

14.2 FORCE ON A CURRENT CARRYING CONDUCTOR IN A UNIFORM MAGNETIC FIELD

1. **A current carrying conductor placed in a uniform magnetic field will experience:**

(a) Electrical Force (b) Magnetic Force (c) Gravitational Force (d) Nuclear Force

2. **Direction of $\vec{L} \times \vec{B}$ is same as:**

(a) Magnetic field (b) Electric field (c) Magnetic force (d) Electric force

3. **The units of magnetic field B, in system international is:**

(a) Weber (b) Tesla (c) Gauss (d) Newton

4. **One tesla (T) is:**

(a) $1T = 1N\ A\ m^{-1}$ (b) $1T = 1NmA^{-1}$ (c) $1T = 1N\ A\ m$ (d) $1T = 1N\ A^{-1}m^{-1}$

5. **Two parallel wires carrying current in the same direction:**

(a) Attract each other (b) repel each other (c) cancel their effect (d) no effect on each other

6. **If fingers of right hand show the direction of magnetic field and palm shows the direction of force, then thumb points for:**

(a) Torque (b) Voltage (c) Current (d) Induced emf

7. **A dot represent the direction of a quantity:**

(a) Into the page (b) Out of page (c) Tangent to page (d) Normal to page

MCQ # 1: (b)	MCQ # 2: (a)	MCQ # 3: (b)	MCQ # 4: (d)	MCQ # 5: (a)	MCQ # 6: (c)	MCQ # 7: (b)

MCQs Related to the Article "14.3 MAGNETIC FLUX AND FLUX DENSITY"

1. **The magnetic flux "ϕ" through an area "A" is:**

(a) $\phi = \mathbf{B} \times \mathbf{A}$ (b) $\phi = \mathbf{B}.\mathbf{A}$ (c) $\phi = \mathbf{A} \times \mathbf{B}$ (d) None of these

2. **The S.I. unit of magnetic flux is**

(a) Tesla (b) Weber (c) Joule (d) Newton

3. **One weber is equal to**

(a) $N.A^2/A$ (b) $N.m^2/A$ (c) N.A/m (d) N.m/A

4. **One Tesla is also equal to**

(a) Wb m^{-2} (b) Wb m^2 (c) Wb m (d) None

5. **Magnetic flux will be maximum if the angle between magnetic field strength and vector area is:**

(a) 0° (b) 60° (c) 90° (d) 180°

6. **Wb m^{-2} is equal to:**

(a) 10^3 gauss (b) 10^6 gauss (c) 10^4 gauss (d) 10^5 gauss

7. **If 0.5 T filled over an area of 2 m^2 which lies at an angle of 60° with the field. Then the resultant flux will be:**

(a) 0.25 T (b) 0.25 Wb (c) 0.5 T (d) 0.5 Wb

MCQ # 1: (b)	MCQ # 2: (b)	MCQ # 3: (d)	MCQ # 4: (a)	MCQ # 5: (a)	MCQ # 6: (c)	MCQ # 7: (d)

MCQs Related to Article "14.4 AMPERE'S LAW AND DETERMINATION OF FLUX DENSITY"

1. **Magnetic induction at a point due to the current carrying conductor is determined by:**

(a) Ampere's law (b) Faraday's law (c) Lenz's Law (d) Newton's law

2. **$\sum_{r=1}^{N} \mathbf{B}.\Delta\mathbf{L} = \mu_0 I$ is the relation for:**

(a) Milikan's law (b) Gauss's law (c) Ampere's law (d) Lenz's law

3. **The unit of permeability of free space is**

(a) T.m/A (b) $T.m^2/A$ (c) $T.m/A^2$ (d) None

4. **The value of μ_o with SI units is:**

(a) $4\pi \times 10^{-6}\ WbA^{-1}m^{-1}$ (b) $4\pi \times 10^{-7} WbA^{-1}m^{-1}$

(c) $4\pi \times 10^{-8}\ WbA^{-1}m^{-1}$ (d) $4\pi \times 10^{-9} WbA^{-1}m^{-1}$

5. The magnetic induction inside current carrying solenoid is

(a) $\mu_o N$ (b) $\mu_o NL$ (c) $\mu_o nI$ (d) None of these

6. When the number of turns in a solenoid is doubled without any change in the length of the solenoid its self induction will be:

(a) Four times (b) Doubled (c) Halved (d) One forth

MCQ # 1: (a)	MCQ # 2: (c)	MCQ # 3: (a)	MCQ # 4: (b)	MCQ # 5: (c)	MCQ # 6: (b)

MCQs Related to "14.5 FORCE ON A MOVING CHARGE IN MAGNETIC FIELD"

1. If the angle between v and B is zero then magnetic force will be

(a) Maximum (b) Minimum (c) Zero (d) None

2. Force on a moving charge in a uniform magnetic field will be maximum, when angle between v and B is:

(a) 0° (b) 30° (c) 60° (d) 90°

3. A charged particles is projected at an angle into a uniform magnetic field. Which of the following parameter of the charged particle will be affected by magnetic field:

(a) Energy (b) Charge (c) Speed (d) Velocity

4. The unit of $\vec{E}$ is NC^{-1} and that of $\vec{B}$ is $NA^{-1}m^{-1}$, the unit $\frac{E}{B}$ is:

(a) ms^{-2} (b) ms (c) ms^{-1} (d) $m^{-1}s^{-1}$

5. Magnetic force on a charge particle moving in magnetic field is perpendicular to:

(a) Velocity of particle (b) magnetic field (c) electric field (d) Both a & b

6. If the charge is at rest in magnetic field, then force on charge is:

(a) $q(\vec{v} \times \vec{B})$ (b) zero (c) $qvB\cos\theta$ (d) qvB

7. If F_1 and F_2 are forces acting on an alpha particle and electron respectively, when moving perpendicular to the magnetic field, then

(a) $F_1 = F_2$ (b) $F_1 > F_2$ (c) $F_1 < F_2$ (d) $F_1 = 4F_2$

MCQ # 1: (c)	MCQ # 2: (d)	MCQ # 3: (d)	MCQ # 4: (c)	MCQ # 5: (d)	MCQ # 6: (b)	MCQ # 7: (b)

MCQs Related to "14.6 MOTION OF A CHARGED PARTICLE IN AN ELECTRIC AND MAGNETIC FIELD"

1. The Lorentz force on a charged particle moving in electric field E and magnetic field B is:

(a) $\mathbf{F = F_e + F_m}$ (b) $\mathbf{F = F_e - F_m}$ (c) $\mathbf{F = \frac{F_e}{F_m}}$ (d) $\mathbf{F = F_e \times F_m}$

2. The magnetic force is simply a:

(a) Reflecting force (b) Deflecting force (c) Restoring force (d) Gravitational force

3. It is possible to set a charge at rest into motion with magnetic field

(a) Yes (b) No (c) Some Time (d) None

4. If a charge is free to move in an electric field, then acceleration will be:

(a) $\frac{qE}{m}$ (b) qEm (c) $\frac{q}{Em}$ (d) $\frac{m}{qE}$

5. Work done on a charge particle moving in a uniform magnetic field is:

(a) Maximum (b) Zero (c) Minimum (d) Zero

MCQ # 1: (a)	MCQ # 2: (b)	MCQ # 3: (b)	MCQ # 4: (a)	MCQ # 5: (d)

MCQs Related to "14. 7 DETERMINATION OF e/m OF AN ELECTRON"

1. When a charged particle is projected perpendicular to a uniform magnetic field, its path:

(a) Spiral (b) Helix (c) Ellipse (d) Circular

2. The electrons of mass "m" and charge "e" is moving in a circle of radius "r" with speed "v" in a uniform magnetic field of strength "B". then

(a) $r \propto m$ (b) $r \propto B$ (c) $r \propto \frac{1}{v}$ (d) $r \propto \frac{1}{m}$

3. Charge to mass ratio of Neutron is:

(a) 1.758×10^{-11} C/kg (b) 9.58×10^{7} C/kg (c) 1.758×10^{11} C/kg (d) zero

4. The $\frac{e}{m}$ of electron is:

(a) $\frac{B^2r^2}{2V}$ (b) $\frac{2V}{B^2r^2}$ (c) $\frac{B^2r^2}{V}$ (d) $\frac{V}{B^2r^2}$

5. The value of $\frac{e}{m}$ is smallest for

(a) Proton (b) Electron (c) β −particle (d) Positron

6. When a charged particle moves through a magnetic field, it suffers change in

(a) Charge (b) Mass (c) Energy (d) Direction of motion

MCQ # 1: (d)	MCQ # 2: (a)	MCQ # 3: (d)	MCQ # 4: (b)	MCQ # 5: (a)	MCQ # 6: (d)

MCQs Related to the Article "14.8 CATHODE RAY OSCILLOSCOPE"

1. Beam of electrons are also called:
(a) Positive rays (b) x-rays (c) cathode rays (d) cosmic rays

2. The high speed graph plotting device is:
(a) ERG (b) CRO (c) Galvanometer (d) Ammeter

3. The anode in the CRO is:
(a) Control number of electrons (b) Control the brightness of spot formed
(c) Accelerates and focus the beam (d) At negative potential with respect to cathode

4. The brightness of spot on CRO screen is controlled by:
(a) Anodes (b) Cathodes (c) Deflection Plates (d) Grid

5. In CRO, the number of electrons are controlled by operating :
(a) Anodes (b) Cathodes (c) Grid (d) Plates

6. The electron gun in CRO consists of:
(a) Grid (b) Three Anodes (c) Indirectly heated cathodes (d) All a, b & c

7. When beam of electrons falls on the screen of CRO, it makes a visible spot because the screen is:
(a) Polished (b) Dark (c) Clear (d) Fluorescent

8. The material used in fluorescent screen is
(a) Electric (b) Magnetic (c) Phosphors (d) None

9. In CRO, the output wave form of time base generator is:
(a) Circular (b) Square (c) Sinusoidal (d) Saw-Tooth

10. The waveform of sinusoidal voltage, its frequency and phase can be found by
(a) CRO (b) Diode (c) Transistor (d) Radio

MCQ # 1: (c)	**MCQ # 2: (b)**	**MCQ # 3: (c)**	**MCQ # 4: (d)**	**MCQ # 5: (c)**	**MCQ # 6: (d)**	**MCQ # 7: (d)**
MCQ # 8: (c)	**MCQ # 9: (d)**	**MCQ # 10: (a)**				

MCQs Related to the Article "14.9 TORQUE ON A CURRENT CARRYING COIL"

1. A current carrying loop, when placed in a uniform magnetic field will experience
(a) Electric flux (b) Torque (c) Magnetic flux (d) Force

2. Torque on a current carrying coil is:
(a) $BINA\ \cos\alpha$ (b) $BINA\ \sin\alpha$ (c) $BIL\ \cos\alpha$ (d) $BIL\ \sin\alpha$

3. The toque in the coil can be increased by increasing
(a) Number of turns (b) Current & magnetic field
(c) Area of coil (d) All of above

4. The relation for maximum value of deflecting couple is given by:
(a) $\tau = \frac{B}{NIA}$ (b) $\tau = BINA$ (c) $\tau = BNA$ (d) $\tau = BNA\sin\theta$

5. The torque acting on a current carrying coil is maximum, when plane of coil is:
(a) Perpendicular to **B** (b) Makes 45° with **B** (c) Parallel to **B** (d) None of these

MCQ # 1: (b)	**MCQ # 2: (a)**	**MCQ # 3: (d)**	**MCQ # 4: (b)**	**MCQ # 5: (c)**

MCQs Related to the Article"14.10 GALVANOMETER"

1. Instrument used for detection of current is called:
(a) Ohmmeter (b) Voltmeter (c) Ammeter (d) Galvanometer

2. The galvanometer constant in a moving coil galvanometer is given by:
(a) $K = \frac{NB}{CA}$ (b) $K = \frac{NAB}{C}$ (c) $K = \frac{C}{NAB}$ (d) $K = \frac{CA}{NB}$

3. The galvanometer can be made sensitive if the value of the factor $\frac{C}{BNA}$ is:
(a) Made large (b) Made small (c) Remains constant (d) Infinite

4. The relation between current "I" and deflection "θ" in a moving coil galvanometer is:
(a) $I \propto \frac{1}{\theta}$ (b) $I \propto \cos\theta$ (c) $I \propto \sin\theta$ (d) $I \propto \theta$

5. The pole pieces of the magnet in galvanometer are made concave to make the field
(a) Radial (b) Stronger (c) Weaker (d) Both a & b

MCQ # 1: (d)	**MCQ # 2: (c)**	**MCQ # 3: (b)**	**MCQ # 4: (d)**	**MCQ # 5: (d)**

MCQs Related to "CONVERSION OF GALVANOMETER INTO AMMETER"

AMMETER

1. Ammeter is used to measure:
(a) Resistance (b) Voltage (c) Current (d) Capacitance

2. When a small resistance is connected parallel to galvanometer, the resulting circuit behaves as:

(a) Voltmeter (b)Ammeter (c) Potentiometer (d) Wheatstone bridge

3. A shunted galvanometer is called:

(a) Voltmeter (b) Ohmmeter (c) AVO meter (d) Ammeter

4. To measure the current in a circuit, ammeter is always connected in:

(a) Parallel (b) Series

(c) Sometimes parallel sometimes series (d) Neither series nor parallel

5. To find the shunt resistance, we used equation

(a) $R_S = \frac{I_g R_g}{I - I_g}$ (b) $R_S = \frac{I R_g}{I - I_g}$ (c) $R_S = \frac{I - I_g}{I_g R_g}$ (d) $R_S = \frac{I - I_g}{I R_g}$

MCQ # 1: (c)	MCQ # 2: (b)	MCQ # 3: (d)	MCQ # 4: (b)	MCQ # 5: (a)

MCQs Related to "CONVERSION OF GALVANOMETER INTO VOLTMETER"

1. Voltmeter is used to measure:

(a) Current (b) Resistance (c) Temperature (d) Potential difference

2. To convert a Weston-type galvanometer into voltmeter, the series resistance is given by

(a) $R_h = \frac{V}{I_g}$ (b) $R_h = \frac{V}{I_g} - R_g$ (c) $R_h = \frac{V}{R_g} - I_g$ (d) $None\ of\ these$

3. The resistance of a voltmeter should have a very high resistance

(a) It does not disturb the circuit (b) It draws some current

(c) It controls the galvanometer coil (d) None of these

4. A voltmeter is always connected in circuit to measure the potential difference in

(a) Parallel (b) Series (c) Perpendicular (d) Straight Line

5. An ideal voltmeter has

(a) Small resistance (b) High resistance (c) Infinite resistance (d) None

MCQ # 1: (d)	MCQ # 2: (b)	MCQ # 3: (a)	MCQ # 4: (a)	MCQ # 5: (c)

MCQs Related to "CONVERSION OF GALVANOMETER INTO OHMMETER"

1. When ohmmeter gives full scale deflection, it indicates:

(a) Zero Resistance (b) Small Resistance (c) Infinite Resistance (d) None of these

2. A battery is used in:

(a) Voltmeter (b) Ammeter (c) Galvanometer (d) Ohmmeter

MCQ # 1: (a)	MCQ # 2: (d)

MCQs Related to the Article "14.11 AVOMETER"

1. AVO-meter is used to find

(a) Current (b) Voltage (c) Resistance (d) All of above

2. In AVO meter, the current is measured when number of low resistances are connected with galvanometer in:

(a) Perpendicular (b) series (c) parallel (d) both series and parallel

3. Useful device to measure resistance, current and potential difference is an electronic instrument called:

(a) Voltmeter (b) Ohmmeter (c) Ammeter (d) Multimeter

4. Digital version of AVO meter is called:

(a) Digital ammeter (b) Digital Rectifier (c) Digital Multimeter (d) Digital Voltmeter

MCQ # 1: (d)	MCQ # 2: (c)	MCQ # 3: (d)	MCQ # 4: (c)