CHAPTER # 12
ELECTROSTATICS

MCQs Related to "ELECTRIC CHARGE"

1. Solid bodies are charged due to the transfer of:

(a) Protons (b) Electrons (c) Neutrons (d) All of these

2. The SI unit if elelctric charge is:

(a) Volt (b) Henry (c) Coulomb (d) Weber

3. Charge on an electron is:

(a) $1.6 \times 10^{19}\ C$ (b) $1.6 \times 10^{-19}\ C$ (c) $9.1 \times 10^{-31}\ C$ (d) $1.67 \times 10^{-27}\ C$

4. How many electron will have a charge of one coulomb?

(a) 6.2×10^{18} (b) 6.2×10^{19} (c) 5.2×10^{18} (d) 5.2×10^{19}

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

MCQs Related to "12.1 COULOMB'S LAW"

1. Coulomb's law is only applicable for

(a) Big charges (b) Small charges (c) Point charges (d) All charges

2. If the distance between two point charges is doubled, the force between them will become:

(a) Doubled (b) Half (c) Three Times (d) One forth

3. The constant k in Coulomb's Law depends upon

(a) Nature of medium (b) System of units (c) Intensity of charge (d) Both a & b

4. The value of permitivity of free space ε_o is:

(a) $8.85 \times 10^{-12}\ \frac{C^2}{Nm^2}$ (b) $8.85 \times 10^{-12}\ \frac{Nm^2}{C^2}$ (c) $8.85 \times 10^{-12}\ \frac{Nm}{C^2}$ (d) $8.85 \times 10^{-12}\ \frac{N}{C^2m^2}$

5. The value of coulomb's constant k is:

(a) $9 \times 10^9\ \frac{C^2}{Nm^2}$ (b) $9 \times 10^9\ \frac{Nm^2}{C^2}$ (c) $9 \times 10^9\ \frac{Nm}{C^2}$ (d) $9 \times 10^9\ \frac{N}{C^2m^2}$

6. Unit relative permitivity is

(a) $\frac{C^2}{Nm^2}$ (b) $\frac{Nm^2}{C^2}$ (c) $\frac{N}{C^2m^2}$ (d) no unit

7. Presence of dielectric always:

(a) Increases the electrostatic force (b) Decreases the electrostatic force

(c) Does not effect the electrostatic force (d) Doubles the electrostatic force

8. The value of relative permitivity for all the dielectrics is always:

(a) Less than unity (b) Greater than unity (c) Equal to unity (d) Zero

9. Relative permitivity of air is:

(a) 1.06 (b) 1.006 (c) 1.0006 (d) 1.6

10. The force between two similar unit charges placed one meter apart in air is:

(a) Zero (b) One newton (c) $9 \times 10^9\ N$ (d) $9 \times 10^{19}\ N$

11. If the magnitude of charges and distance between them is doubled, then the force will be:

(a) Doubled (b) Halved (c) Remain same (d) On forth

12. When an insulating medium is placed between two charges, the electrostatic force:

(a) Increases (b) decreases (c) zero (d) Remain Same

13. The electrostatic force between two charges is 42 N. If we place a dielectric of $\varepsilon_r = 2.1$, between the charges, then the force become equal to:

(a) 42N (b) 88.2 N (c) 2 N (d) 20 N

MCQ # 1: (c)	**MCQ # 2: (d)**	**MCQ # 3: (d)**	**MCQ # 4: (a)**	**MCQ # 5: (b)**	**MCQ # 6: (d)**	**MCQ # 7: (b)**
MCQ # 8: (b)	**MCQ # 9: (c)**	**MCQ # 10: (c)**	**MCQ # 11: (c)**	**MCQ # 12: (b)**	**MCQ # 13: (d)**	

MCQs Related to "12.2 FIELDS OF FORCE"

1. A charge at rest creates around it

(a) Electric field (b) Magnetic field (c) Gravitational field (d) Nuclear field

2. The force experience by a unit positive charge placed at a point in an electric field is called:

(a) Coulomb's force (b) Faraday's force (c) Lorentz's force (d) Electric field intensity

3. NC^{-1} is a unit of

(a) Force (b) Charge (c) Current (d) Electric Intensity

4. If we move away from a charge, the magnitude to electric intensity

(a) Remains constant (b) Increases (c) Decreases (d) Vanish

5. Of the following quantities, the one that is vector in character is an

(a) Electric Charge (b) Electric Field Intensity

(c) Electric Energy (d) Electric Potential Difference

6. A charge of 1 μC experiences electrostatic force of 10^{-6}N, the electric field intensity at that point

(a) 10^{6} NC^{-1} (b) 10^{-6} NC^{-1} (c) 10^{-12} NC^{-1} (d) 1 NC^{-1}

7. The electric intensity at infinite distance from point charge is

(a) Infinite (b) zero (c) positive (d) negative

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

MCQs Related to "12.3 ELECTRIC FIELD LINES"

1. The lines which provide information about the electric force exerted on charged particles are:

(a) Magnetic field lines (b) Electric field lines (c) Tangent lines (d) Curved lines

2. Electric field lines are

(a) Actual Line (b) Imaginary Lines (c) Solid Lines (d) None of These

3. The tangent to a field line at any point gives the direction of

(a) Electric Intensity (b) Electric Flux (c) Vector Area (d) Electric Current

4. The electric field lines are closer where the field is:

(a) Strong (b) Weak (c) Uniform (d) Variable

5. Electric field lines can never

(a) Attract each other (b) Repel each other (c) Intersect each other

6. The electric field produced due to negative charge is always:

(a) Radially outward (b) Radially inward (c) Circular (d) Zero

7. The electric field created by positive charge is:

(a) Radially outward (b) Zero (c) Circular (d) Radially inward

8. Electric lines of force are parallel and equally spaced, then the electric field is:

(a) Weak (b) Strong (c) Non-Uniform (d) Uniform

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

MCQs Related to "12.4 APPLICATIONS OF ELECTROSTATICS"

1. Photo-copier and inkjet printers are the applications of:

(a) Electronics (b) Magnetism (c) Electrostatics (d) Thermodynamics

2. The word "Xerography" means:

(a) Writing by left hand (b) Writing by children (c) Dry writing (d) Writing by water colors

3. Aluminum is an excellent

(a) Conductor (b) semi-conductor (c) Insulator (d) photoconductor

4. Selenium is a conductor material when exposed to _____

(a) Dark (b) Light (c) Magnetic field (d) None of these

5. Selenium is an

(a) Insulator (b) Conductor (c) Semiconductor (d) Photoconductor

6. Which part of photocopier is known as the heart of machine

(a) Drum (b) lamp (c) roller (d) toner

7. In ink-jet printer, the droplets are passed through

(a) Gutter (b) Charging electrode (c) Deflection plates (d) Both b & c

8. In an inkjet printer, the charged ink drops are diverted by the deflection plates

(a) Towards the charging electrodes (b) Towards the gutter

(c) Towards a blank paper (d) In inkjet printer, ink cannot be charged

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

MCQs Related to "12.5 ELECTRIC FLUX"

1. Number of electric lines of force passing through a certain area is known as

(a) Electric field (b) Electric flux (c) Electric potential (d) Potential difference

2. Electric flux is defined as:

(a) $\phi = \mathbf{A}.\mathbf{B}$ (b) $\phi = \mathbf{E} \times \mathbf{A}$ (c) $\phi = \mathbf{E}.\mathbf{A}$ (d) $\phi = \frac{\mathbf{E}}{\mathbf{A}}$

3. For the computation of electric flux, the surface area should be:

(a) Parallel (b) Curved (c) Spherical (d) Flat

4. When vector area is held perpendicular to the field lines, then the magnitude of electric flux is:

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

5. When vector area is held parallel to electric field lines, the the magnitude of electric flux is:

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

6. The SI unit of electric flux is:

(a) NmC^{-1} (b) Nm^2C^{-1} (c) NmC^{-2} (d) Nm^2C^{-2}

7. Which one of the following can be taken as measure of electric field intensity:

(a) $\frac{F}{A}$ (b) $\frac{\phi_e}{A}$ (c) $\frac{qA}{\varepsilon_o}$ (d) $\frac{q\varepsilon_o}{A}$

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

MCQs Related to "12.6 ELECTRIC FLUX THROUGH A SURFACE ENCLOSING A CHARGE"

1. The total electric flux through the surface of the sphere due to a charge q at its center is:

(a) $\frac{q}{\varepsilon_r}$ (b) $\frac{q}{\varepsilon_o}$ (c) $\frac{\varepsilon_o}{q}$ (d) both a & b

2. Electric flux through a close surface does not depend upon:

(a) Shape (b) medium (c) charge (d) none of these

3. The direction of vector area is

(a) Parallel to flat surface (b) perpendicular to flat surface

4. Negative and positive charges in a hollow sphere are equal in magnitude, then the flux from the surface will be:

(a) Zero (b) Positive (c) Negative (d) Both positive and negative

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

MCQs Related to "12.7 GAUSS'S LAW"

1. The total electric flux through any close surface is directly proportional to:

(a) Enclosed mass (b) Enclosed charge (c) Volume (d) Electric potential

2. According to Gauss's law, electric flux through any close surface is

(a) $\phi_e = \frac{1}{4\pi\varepsilon_o}\frac{q}{r}$ (b) $\phi_e = \frac{1}{\varepsilon_o}\frac{q}{r}$ (c) $\phi_e = \frac{q}{\varepsilon_o}$ (d) $\phi_e = \frac{1}{4\pi\varepsilon_o}(q)$

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

MCQs Related to "12.8 APPLICATIONS OF GAUSS'S LAW"

1. Gauss's law is more useful in the cases where the charge distributions:

(a) are made of discrete point charges (b) are finite in their special extent

(c) symmetrical charge distribution (d) gives rise to inverse square law distribution

2. The imaginary close surface which passes through the point at which electric intensity is to be measured is called:

(a) Amperean loop (b) Gaussian surface (c) Vector area

3. Electric intensity inside hollow charged sphere is:

(a) (σ/ε_0) (b) $(\sigma/2\varepsilon_0)$ (c) $(1/\varepsilon_0)$ (d) zero

4. The magnitude of the electric field inside oppositely charged plates, having uniform surface charge density σ, is:

(a) (σ/ε_0) (b) $(\sigma/2\varepsilon_0)$ (c) $(q/\varepsilon_0 r)$ (d) $(\sigma/2\varepsilon_0 r)$

5. The electric intensity near an infinite plate of positive charge will be:

(a) (q/ε_0) (b) $(\sigma/2\varepsilon_0)$ (c) (q/A) (d) (σ/ε_0)

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

MCQs Related to "12.9 ELECTRIC POTENTIAL"

1. If a charged body is moved agaist the electric field, it will gain:

(a) Potential energy (b) Kinetic energy (c) Mechanical energy (d) Gravitational energy

2. The work done in moving a unit positive charge from one point to another while keeping the charge in equilibrium is called:

(a) Potential energy (b) Kinetic energy (c) Mechanical energy (d) Potential Difference

3. Work done in bringing a unit positive charge from infinity to that point in an electric field is called:

(a) Potential Difference (b) Resistance Capacitance (d) Absolute electric potential

4. Absolute electric potential, due of point charge of 1C at a distance of 1m is given by:

(a) $9 \times 10^6\ volts$ (b) $9 \times 10^7\ volts$ (c) $9 \times 10^8\ volts$ (d) $9 \times 10^9\ volts$

5. One volt is

(a) $\frac{joule}{coulomb}$ (b) $\frac{newton}{coulomb}$ (c) $\frac{coulomb}{second}$ (d) $\frac{watt}{second}$

6. Electric field intensity is also known as

(a) Electric potential (b) Electric flux (c) Potential gradient (d) None

7. The expression $\frac{\Delta V}{\Delta r}$ represent:

(a) Gauss's law (b) Electric flux (c) Electric Intensity (d) Potential Difference

8. In a region where the electric field is zero, the electric potential is always:

(a) Positive (b) Negative (c) Zero (d) Constant

9. In the expression $E = -\frac{\Delta V}{\Delta r}$, the negative sign show that the direction of E is along:

(a) Increasing potential (b) Decreasing potential

10. The electric intensity is expressed in unit of N/C or

(a) volts (b) watt (c) joules (d) $\frac{volt}{meter}$

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

MCQs Related to "12.10 ELECTRON VOLT"

1. Electron volt is the unit of

(a) Electric Current (b) Electric Energy (c) Electric Potential (d) Electric Force

2. The amount of energy equal to $1.6 \times 10^{-19}\ J$ is called

(a) 1 volt (b) 1 milli-volt (c) 1 electron volt (d) 1 mega electron volt

3. A particle having 2e charge falls through a potential difference of 5V. Energy acquired by it is:

(a) 2.5 eV (b) 20 eV (c) 0.4 eV (d) 10 eV

4. A charge of 0.01 C accelerated through a p.d of 1000 V acquires K.E

(a) 10 J (b) 100 J (c) 200 J (d) 400 eV

5. 1 joule =_____

(a) $6.25 \times 10^{18}\ eV$ (b) $6.25 \times 10^{-18}\ eV$ (c) $1.6 \times 10^{-19}\ eV$ (d) $9.1 \times 10^{-31}\ eV$

6. One electron volt is equal to

(a) $6.25 \times 10^{18}\ J$ (b) $6.25 \times 10^{-18}\ J$ (c) $1.6 \times 10^{-19}\ J$ (d) $9.1 \times 10^{-31}\ J$

7. If a positive charge particle moves against the electric field, it will gain:

(a) Kinetic Energy (b) Gravitational Energy (c) Electric Potential Energy

8. If a positive charge particle is allowed to moves from positive to negative plate, it will gain:

(a) Kinetic Energy (b) Gravitational Energy (c) Electric Potential Energy

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

MCQs Related to "12.11 ELECTRIC AND GRAVITATIONAL FORCES (A COMPARISON)"

1. Electrostatic force as compared to the gravitational force is

(a) Very weak (b) Very strong (c) Infinite (d) None of these

2. Gravitational force between two objects does not depend on:

(a) Force (b) Masses (c) Distance (d) Medium

3. Gravitational force is an:

(a) Attractive force (b) Repulsive Force (c) Attractive as well as repulsive

4. Electrostatic force is:

(a) Attractive force (b) Repulsive Force (c) Attractive as well as repulsive

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

MCQs Related to "12.12 CHARGE ON AN ELECTRON BY MILLIKAN'S METHOD"

1. The charge on the electron was calculated by

(a) Faraday (b) J.J. Thomson (c) Millikan (d) Einstein

2. Millikan devised a technique for measurement of charge on an electron in

(a) 1889 (b) 1899 (c) 1909 (d) 1929

3. In Millikan's experiment, the oil drop can be suspended between two plates when the gravitational force is equal to

(a) Magnetic Force (b) Electric Force (c) Normal Force (d) Nuclear Force

4. An electric field that balance the weight of an oil droplet will act

(a) Downward (b) Upward (c) Along surface of sphere

5. The equation for the stokes law is $F_D =$ _____

(a) $6\pi\eta r$ (b) $8\pi\eta r v$ (c) $6rv$ (d) $6\pi\eta r v$

6. The charge determined by the Millikan's experiment is

(a) $q = \frac{mgd}{V}$ (b) $q = \frac{mVd}{g}$ (c) $q = \frac{gVd}{m}$ (d) None of these

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

MCQs Related to "12.13 CAPACITOR"

1. Capacitors may be considered as a device for

(a) Storing energy (b) Increasing resistance (c) Decreasing resistance (d) None

2. The charge stored in a capacitor is directly proportional to

(a) Resistance (b) Resistivity (c) Amount of Current (d) Potential Difference

3. An expression for magnitude of charge on either of the plates of a capacitor is given by:

(a) $Q = CA$ (b) $Q = CV$ (c) $Q = \frac{C}{A\varepsilon_0}$ (d) $Q = \frac{A\varepsilon_0}{d}$

4. Farad is the S.I. unit of

(a) Charge (b) Current (c) Electric Flux (d) Capacitance

5. Farad is defined as:

(a) $\frac{Coulomb}{Volt}$ (b) $\frac{Ampere}{Volt}$ (c) $\frac{Coulmb}{Joult}$ (d) $\frac{Joule}{Coulomb}$

6. A capacitor of capacitance $1\mu F$ is fully charged from a $20\,V$ D.C. source. What is the charge stored by the capacitor:

(a) 2 μC (b) 20 μC (c) 0.5 μC (d) 200 μC

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

MCQs Related to "12.14 CAPACITANCE OF A PARALLEL PLATE CAPACITOR"

1. If the medium between the plates of a parallel plate capacitor is air or vacuum, then its capacitance is given by:

(a) $C_{vac} = \frac{A}{\varepsilon_0\, d}$ (b) $C_{vac} = \frac{A\varepsilon_0}{d}$ (c) $C_{vac} = \frac{\varepsilon_0\, d}{A}$ (d) $C_{vac} = \frac{d}{\varepsilon_0\, A}$

2. The medium used between the plates of capacitor is called

(a) Polarization (b) Dielectric (c) Insulators (d) Medium

3. If some dielectric medium of dielectric constant ε_r is inserted between the plates of a parallel plate capacitor, then its capacitance is given by:

(a) $C_{med} = \frac{A}{\varepsilon_0\varepsilon_r\, d}$ (b) $C_{med} = \frac{A\varepsilon_0\,\varepsilon_r}{d}$ (c) $C_{med} = \frac{\varepsilon_0\varepsilon_r\, d}{A}$ (d) $C_{med} = \frac{d}{\varepsilon_0\,\varepsilon_r A}$

4. Inserting a dielectric between the plates of a charged parallel plate capacitor

(a) Decreases Capacitance (b) Increases capacitance
(c) Leaves the capacitance same (d) Encourages the breakdown between plates

5. The ratio of C_{vac} and C_{med} is equal to

(a) ε_r (b) $\frac{1}{\varepsilon_r}$ (c) ε_0 (d) $\frac{1}{\varepsilon_0}$

6. If 'Q' is the charge on either of the plates of a parallel plate capacitor of area A, the surface charge density on the plate is given by:

(a) $\sigma = \frac{A}{Q}$ (b) $\sigma = \frac{Q}{2A}$ (c) $\sigma = \frac{Q}{A}$ (d) $\sigma = \frac{2A}{Q}$

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

MCQs Related to "12.15 ELECTRIC POLARIZATION OF DIELECTRICS"

1. When a dielectric material s placed in an electric field, it:

(a) Conducts (b) Exhibit Charge (c) Undergoes Electrolysis (d) Become Polarized

2. Two equal and opposite charge separated by a small distance form:

(a) Electric dipole (b) Amperean current (c) Null charge (d) Neutral source

3. Dielectric is also called:

(a) Conductor (b) Insulator (c) Semi-Conductor

4. The increase in capacitance of a capacitor due to presence of dielectric is due to_____of dielectric

(a) Electrification (b) Ionization (c) Electrolysis (d) Electric Polarization

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

MCQs Related to "12.16ENERGY STORED IN A CAPACITOR"

1. The expression of energy stored in a capacitor is given by:

(a) $U = CV^2$ (b) $U = \frac{1}{2}CV^2$ (c) $U = \frac{1}{2}C^2V$ (d) $U = \frac{1}{2}(CV)^2$

2. If the potential difference across the two plates of a parallel plate capacitor is double, then the energy stored in it will be:

(a) 2 times (b) 8 times (c) 4 times (d) Remains constant

3. Energy density in case of a capacitor is always proportional to

(a) ε_o (b) C (c) V^2 (d) E^2

4. Unit of energy density of electric field is:

(a) J C^{-1} (b) J V^{-1} (c) J m^{-3} (d) J F^{-3}

5. A capacitor stores energy in the form of:

(a) Magnetic field (b) Heat energy (c) Electrical energy (d) Mechanical energy

6. The expression for the energy density u is:

(a) $\frac{1}{2}\varepsilon_0\varepsilon_r E^2\,(Ad)$ (b) $\frac{1}{2}\,\varepsilon_0\varepsilon_r E^2$ (c) $\frac{1}{2}\,\frac{\varepsilon_0\varepsilon_r E^2}{Ad}$ (d) $\frac{\varepsilon_0\varepsilon_r E^2}{Ad}$

7. Will a capacitor store more energy with a dielectric other than air?

(a) Yes (b) No

8. In a charged capacitor, the energy resides in:

(a) In the negative plate (b) in the positive plate (c) edges of plates in (d) field between plates

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

MCQs Related to "12.17 CHARGING AND DISCHARGING A CAPACITOR"

1. The speed of charging or discharging a cpacitor depends upon product of resistance and _____

(a) Current (b) Voltage (c) Capacitance (d) Charge

2. The term "RC" has same unit as that of:

(a) Potential (b) Capacitance (c) Energy (d) Time

3. During charging of a capacitor, the ratio of instantaneous charge and maximum charge on plates of capacitors at t = RC is

(a) 36.8% (b) 63.2% (c) 20% (d) 30%

4. If RC is small, then capacitor will be charged and discharged

(a) Slowly (b) Quickly (c) With Medium Speed (d) No Effect

5. In RC series circuit, the correct relation for the time constant is:

(a) $R.t = C$ (b) $C.t = R$ (c) $R.C = t$ (d) $C.V = Q$

6. A 5 MΩ resistor is connected with a 2 μF capacitor. The time constant of the circuit is:

(a) 0.1 s (b) 1 s (c) 2.5 s (d) 10 s

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

CHAPTER # 13
CURRENT ELECTRICITY

MCQs Related to the Article "13.1 ELECTRIC CURRENT"

1. One coulomb per second is equal to

(a) Joule (b) Volt (c) Ampere (d) Watt

2. Conventional current flow from

(a) From higher potential to lower potential (b) From lower potential to higher potential
(c) From lower potential to lower potential (d) None

3. In the metallic conductor the current is due to flow of _____

(a) Positron (b) Electrons (c) Proton (d) Neutrons

4. In liquids and gases, the current is due to the motion of :

(a) Negative charges (b) Positive charges (c) Neutral particles d) Both negative and positive charges

5. Charge carries in electrolytes are:

(a) Protons (b) electrons (c) holes (d) positive and negative ions

6. Dirft velocity of electrons in a conductor is:

(a) $10^{-2}\ ms^{-1}$ (b) $10^{-3}\ ms^{-1}$ (c) $10^{3}\ ms^{-1}$ (d) $10^{2}\ ms^{-1}$

7. A battery move a charge of 40 C around a circuit at constant rate in 20 s. The current will be:

(a) 2 A (b) 0.5 A (c) 80 A (d) 800 A

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

MCQs Related to the Article "13.2 SOURCES OF CURRENT"

1. In the thermocouple the heat energy is converted into

(a) Mechanical energy (b) Electric energy (c) Magnetic energy (d) None

2. An electric generator converts _____ into electrical energy:

(a) Heat energy (b) Electric energy (c) Magnetic energy (d) Mechanical Energy

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

MCQs Related to the Article "13.3 EFFECTS OF CURRENT"

1. The heating effect of current utilized in

(a) Iron (b) Tube light (c) Fan (d) Motor

2. The heat produced by passage of current through resistor (Joule's Law) is:

(a) $H = \frac{I}{Rt}$ (b) $H = IR^2t$ (c) $H = \frac{I^2}{Rt}$ (d) $H = I^2Rt$

3. Magnetic effect of current is utilized in:

(a) Heater (b) Iron (c) Electrolyte (d) Electric Motor

4. Current can be measured by using:

(a) Heating effect (b) Magnetic effect (c) Chemical effect (d) None of these

5. When electricity passes through the liquid, then process is called:

(a) Electro late (b) Electrolysis (c) Electro-fluid (d) None

6. The electrode connected with positive terminal of the battery is called:

(a) Anode (b) Cathode

7. Through an electrolyte, electric current is passed due to drift of

(a) Free electrons (b) Protons
(c) Free electrons and holes (d) Positive and negative ions

8. In electrolysis processes of $CuSO_4$, Cu is deposited on:

(a) Anode (b) Cathode

9. The process in which a thin layer of some expensive metal is deposited on the article of cheap metal is called

(a) Metal Depositing (b) Overlapping (c) Electroplating (d) Coating

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

MCQs Related to the Article "13.4 OHM'S LAW"

1. The current flowing through a conductor is directly proportional to the applied potential difference across its ends provided that temperature remains constant is statement of:

(a) Boyle's Law (b) Charles's Law (c) Joule's Law (d) Ohm's Law

2. The VI-graph of Ohm's law is:

(a) Hyperbola (b) Ellipse (c) Parabola (d) Straight

3. Mathematical form of ohm's law is

(a) I = VR (b) I = V/R (c) I = R/V (d) R = IV

4. 1 Ohm is defined as:

(a) 1 (b) 1 (c) 1 (d) 1

5. A source of 10 volts is applied across a wire, the current is:

(a) 1 A (b) 2 A (c) 10 A (d) 15 A

6. Ohm's law is valid for only current flowing in

(a) Conductors (b) Transistors (c) Diodes (d) Electric Areas

7. For non-ohmic devices, the graph between V & I is:

(a) Straight Line (b) Not a Straight Line

8. The proportionality constant between current and potential difference is:

(a) ρ (b) V (c) C (d)

9. In series circuit the net resistance is

(a) Algebraic Sum of all resistance (b) Sum of reciprocals of all resistances in circuit

(c) Remain constant (d) None

10. A wire of resistance R is cut into two equal parts, its resistance becomes R/2. What happens to resistivity?

(a) Double (b) Half (c) Remains same (d) One forth

11. Equivalent resistance when two when two resistance are connected in parallel is given by:

(a) —— (b) (c) —— (d) ——

12. The potential difference between the head to tail of an electric eel is:

(a) 600 V (b) 700 V (c) 800 V (d) 900 V

MCQ # 1: (d)	**MCQ # 2: (d)**	**MCQ # 3: (b)**	**MCQ # 4: (a)**	**MCQ # 5: (b)**	**MCQ # 6: (a)**
MCQ # 7: (b)	**MCQ # 8: (d)**	**MCQ # 9: (a)**	**MCQ # 10: (c)**	**MCQ # 11: (a)**	**MCQ # 12: (a)**

MCQs Related to the Article "13.5 RESISTIVITY AND ITS DEPENDANCE ON TEMPERATURE"

1. The resistance offered by a cubic meter of a substance is called:

(a) Reactance (b) Conductance (c) Conductivity (d) Resistivity

2. The resistivity of a material in terms of its resistance R, cross-sectional area A and length L is:

(a) $\rho =$ — (b) $\rho =$ — (c) $\rho = RLA$ (d) ——

3. The reciprocal of resistivity is called

(a) Resistance (b) Conduction (c) Conductivity (d) None

4. The SI unit of resistivity (specific resistance) is:

(a) Ω. m (b) $(\Omega.m)^{-1}$ (c) $\Omega.m^{-1}$ (d) None

5. The unit of conductivity is

(a) Ω. m (b) (c) $\Omega.m^{-1}$ (d) None

6. When temperature increases, the resistance of conductor:

(a) Increases (b) Decreases (c) Remains constant (d) Vanishes

7. If the length and diameter of conductor is double, the resistance is

(a) Remain same (b) Double (c) Half (d) Four times

8. A wire of uniform cross-section A and length L is cut into two equal parts. The resistance of each part becomes:

(a) Double (b) Half (c) 4 times (d) ¼ times

9. Specific resistance of a material depends upon:

(a) Length (b) Area (c) Temperature (d) Both a & b

10. Temperature coefficient of resistance is equal to:

(a) —— (b) —— (c) —— (d) None of these

11. The fractional change in resistivity per Kelvin

(a) Co-efficient in resistance (b) Co-efficient of resistivity (c) Resistance

12. Temperature coefficient of resistivity is measured in:

(a) Ω K (b) Ωm (c) (d)

MCQ # 1: (d)	**MCQ # 2: (b)**	**MCQ # 3: (c)**	**MCQ # 4: (a)**	**MCQ # 5: (b)**	**MCQ # 6: (a)**
MCQ # 7: (c)	**MCQ # 8: (b)**	**MCQ # 9: (c)**	**MCQ # 10: (c)**	**MCQ # 11: (b)**	**MCQ # 12: (c)**

MCQs Related to the Article "13.6 COLOUR CODE FOR CARBON RESISTANCES"

1. In the carbon resistor, the value of resistance can be find out by their

(a) Wires (b) Terminals (c) Color Bands (d) Spots

2. The color code for carbon resistance usually consist of:

(a) 3 bands (b) 2 bands (c) 4 bands (d) 7 bands

3. The colors of strips on a certain carbon resistor from extreme left are yellow, black and red respectively. Its resistance is:

(a) (b) (c) (d)

4. If the tolerance color is gold then it value is

(a) ± 2% (b) ± 4% (c) (d)

5. If forth band on a carbon resistor is of silver color, then its tolerance is:

(a) ±5% (b) ±10% (c) ±15% (d)

6. If forth band is missing on resistance, its tolerance is:

(a) ±5% (b) ±10% (c) (d)

7. The third band is written in the form of power of

(a) 2 (b) 6 (c) 8 (d) 10

8. The numerical value of black color is:

(a) 3 (b) 2 (c) 1 (d) 0

9. The color code for the color Grey is

(a) 7 (b) 8 (c) 9 (d) 5

10. A rheostat can be used as a

(a) Variable resistor (b) Potential divider (c) Both a and b (d) None of these

11. The wire used in Rheostat is made from

(a) Constantan (b) Nichrome (c) Manganin (d) Tungston

12. The number of terminals in a rheostat are:

(a) 2 (b) 3 (c) 4 (d) 5

13. Heat sensitive resistors are called

(a) Resistors (b) Capacitors (c) Thermisters (d) Inductors

14. Thermistor can be used for the accurate measurement of

(a) Voltage (b) Resistance (c) Temperature (d) Heat

15. Thermistors with high negative temperature coefficient of resistivity are used for accurate measurement of low temperature till:

(a) 1 K (b) 5 K (c) 8 K (d) 10 K

16. Thermistors are composed of:

(a) Semiconductors (b) Metals (c) Metal Oxides (d) Superconductors

MCQ # 1: (c)	**MCQ # 2: (c)**	**MCQ # 3: (a)**	**MCQ # 4: (c)**	**MCQ # 5: (b)**	**MCQ # 6: (d)**
MCQ # 7: (d)	**MCQ # 8: (d)**	**MCQ # 9: (b)**	**MCQ # 10: (c)**	**MCQ # 11: (c)**	**MCQ # 12: (b)**
MCQ # 13: (c)	**MCQ # 14: (c)**	**MCQ # 15: (d)**	**MCQ # 16: (c)**		

MCQs Related to the Article "13.7 ELECTRICAL POWER & POWER DISSIPATION IN RESISTORS"

1. The expression for determining the power dissipation in an electric circuit:

(a) (b) $P = I^2R$ (c) $P =$ — (d) All

2. A resistor is to be connected in series with a 12 V battery. Determine power dissipation:

(a) 0.5 W (b) 6 W (c) 12 W (d) 24 W

3. What is power expended in a resistor when a 5 A current is passing through it:

(a) 50 W (b) 80 W (c) 100 W (d) 500 W

4. A 1200W heater operate on a 120 V line for 1 hour. What is the current passing through it:

(a) 1 A (b) 5 A (c) 10 A (d) 120 A

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

MCQs Related to the Article"13.8 ELECTROMOTIVE FORCE AND POTENTIAL DIFFERENCE"

1. The S.I unit of emf is same as:

(a) Work (b) Energy (c) Power (d) Potential Difference

2. The terminal potential difference of a battery of internal resistance "r" and emf "ε" is:

(a) (b) (c) — (d) —

3. Electromotive force and potential difference, both are measured in:

(a) Coulomb (b) Ampere (c) Volt (d) Newton

4. The emf is always _____, even when no current is drawn through the battery of the cell.

(a) Zero (b) present (c) maximum (d) minimum

5. Which electric bulb has the least resistance?

(a) 60 watts (b) 100 watts (c) 200 watts (d) 500 watts

6. An electric heater 220V, 440W has a resistance

(a) 2 Ω (b) 110 Ω (c) 0.5 Ω (d) 20 Ω

3. The colors of strips on a certain carbon resistor from extreme left are yellow, black and red respectively. Its resistance is:

(a) (b) (c) (d)

4. If the tolerance color is gold then it value is

(a) ± 2% (b) ± 4% (c) (d)

5. If forth band on a carbon resistor is of silver color, then its tolerance is:

(a) ±5% (b) ±10% (c) ±15% (d)

6. If forth band is missing on resistance, its tolerance is:

(a) ±5% (b) ±10% (c) (d)

7. The third band is written in the form of power of

(a) 2 (b) 6 (c) 8 (d) 10

8. The numerical value of black color is:

(a) 3 (b) 2 (c) 1 (d) 0

9. The color code for the color Grey is

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MCQ # 1: (c)	**MCQ # 2: (c)**	**MCQ # 3: (a)**	**MCQ # 4: (c)**	**MCQ # 5: (b)**	**MCQ # 6: (d)**
MCQ # 7: (d)	**MCQ # 8: (d)**	**MCQ # 9: (b)**	**MCQ # 10: (c)**	**MCQ # 11: (c)**	**MCQ # 12: (b)**
MCQ # 13: (c)	**MCQ # 14: (c)**	**MCQ # 15: (d)**	**MCQ # 16: (c)**		

MCQs Related to the Article "13.7 ELECTRICAL POWER & POWER DISSIPATION IN RESISTORS"

1. The expression for determining the power dissipation in an electric circuit:

(a) $P = VI$ (b) $P = I^2R$ (c) — (d) All

2. A resistor is to be connected in series with a 12 V battery. Determine power dissipation:

(a) 0.5 W (b) 6 W (c) 12 W (d) 24 W

3. What is power expended in a resistor when a 5 A current is passing through it:

(a) 50 W (b) 80 W (c) 100 W (d) 500 W

4. A 1200W heater operate on a 120 V line for 1 hour. What is the current passing through it:

(a) 1 A (b) 5 A (c) 10 A (d) 120 A

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

MCQs Related to the Article"13.8 ELECTROMOTIVE FORCE AND POTENTIAL DIFFERENCE"

1. The S.I unit of emf is same as:

(a) Work (b) Energy (c) Power (d) Potential Difference

2. The terminal potential difference of a battery of internal resistance "r" and emf "ε" is:

(a) (b) (c) — (d) —

3. Electromotive force and potential difference, both are measured in:

(a) Coulomb (b) Ampere (c) Volt (d) Newton

4. The emf is always _____, even when no current is drawn through the battery of the cell.

(a) Zero (b) present (c) maximum (d) minimum

5. Which electric bulb has the least resistance?

(a) 60 watts (b) 100 watts (c) 200 watts (d) 500 watts

6. An electric heater 220V, 440W has a resistance

(a) 2 Ω (b) 110 Ω (c) 0.5 Ω (d) 20 Ω

7. Power out is given by:

(a) $\frac{E^2R}{(R+r)^2}$ (b) $\frac{E^2R}{(R+r)+4Rr}$ (c) I^2R (d) All of these

8. The maximum power delivered by battery is:

(a) $P_{max} = \frac{E^2}{4r}$ (b) $P_{max} = 4rE^2$ (c) $P_{max} = VIT$ (d) $Unlimited$

9. When the internal resistance r of a source is equal to the load resistance R, the power output is:

(a) $\frac{E^2}{4R}$ (b) $4rE^2$ (c) VIT (d) $Unlimited$

10. If a resistor of resistance R is connected across a battery of internal resistance r, then the output power will be maximum when:

(a) $R = \frac{r}{2}$ (b) $R = r$ (c) $R = 2r$ (d) $R = 4r$

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

MCQs Related to the Article "13.9 KIRCHHOFF'S RULES"

1. Kirchhoff's first rule is:

(a) $\sum V = 0$ (b) $\sum R = 0$ (c) $\sum I = 0$ (d) $\sum T = 0$

2. Kirchhoff's first rule is based on conservation of:

(a) Energy (b) Voltage (c) Charge (d) Mass

3. Net current arriving a junction point in electric circuit is equal to the current leaving that point is known as:

(a) Ampere's Law (b) Kirchhoff's 1st Law (c) Ohm's Law (d) Kirchhoff's 2nd Law

4. Kirchhoff's first rule is also known as:

(a) Kirchhoff's Point Rule (b) Kirchhoff's Rule for Static Charges
(c) Kirchhoff's Loop Rule (d) Kirchhoff's Rule for Point Charges

5. The algebraic sum of all the current at junction is zero, is Kirchhoff's

(a) 1st law (b) 2nd law (c) 3rd law (d) 4th law

6. Kirchhoff's second rule is based on conservation of:

(a) Energy (b) Voltage (c) Charge (d) Mass

7. The algebraic sum of voltages changes around a closed circuit or loop is zero, is Kirchhoff's

(a) 1st law (b) 2nd law (c) 3rd law (d) 4th law

8. Kirchhoff's second rule is also known as:

(a) Kirchhoff's Loop Rule (b) Kirchhoff's Rule for Static Charges
(c) Kirchhoff's Point Rule (d) Kirchhoff's Rule for Point Charges

9. A complex electric circuit consisting of resistors can be solved by:

(a) Joule's Law (b) Coulomb's Law (c) Kirchhoff's Law (d) Faraday's Law

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

MCQs Related to the Article "13.10 WHEATSTONE BRIDGE"

1. An instrument for accurately determining the value of an unknown resistance:

(a) Galvanometer (b) Voltmeter (c) Ammeter (d) Wheatstone Bridge

2. A Wheatstone bridge consists of:

(a) 2 Resistors (b) 4 Resistors (c) 2 Diodes (d) 4 Diodes

3. The condition for balanced Wheatstone Bridge is:

(a) $\frac{R_1}{R_2} = \frac{R_3}{R_4}$ (b) $\frac{R_3}{R_2} = \frac{R_1}{R_4}$ (c) $\frac{R_1}{R_3} = \frac{R_4}{R_3}$ (d) $\frac{R_1}{R_4} = \frac{R_2}{R_3}$

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

MCQs Related to the Article "13.11 POTENTIOMETER"

1. An ideal voltmeter would have an infinite

(a) Current (b) Voltage (c) Resistance (d) None of these

2. Which of the following is not accurate measuring device?

(a) Digital Multimeter (b) CRO (c) Potentiometer (d) Voltmeter

3. An accurate measurement of emf of a cell is made by

(a) A voltmeter (b) An ammeter (c) A potentiometer (d) All of them

4. The emf of two cells can be compared by

(a) AVO meter (b) Voltmeter (c) Potentiometer (d) Galvanometer

5. The ratio of emf of two cells $\varepsilon_1/\varepsilon_2$, is equal to

(a) l_1/l_2 (b) 1 : 2 (c) l_2/l_1 (d) 2 : 1

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

CHAPTER # 14
ELECTROMAGNETISM

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)

CHAPTER # 15
ELECTROMAGNETIC INDUCTION

MCQs Related to the Article "15.1 INDUCED EMF AND INDUCED CURRENT"

1. The SI units of induced emf is

(a) Ohm (b) Volt (c) Henry (d) Tesla

2. The induced current is a circuit can be increased by:

(a) Using strong magnetic field (b) Moving loop faster
(c) Replacing the loop by the coil of many turns (d) All a, b & c

3. Identify the phenominon by which an induced emf can be generated:

(a) By moving magnet (b) By rotating a coil in it
(c) By moving a coil towards stationary magnet (d) All a, b & c

4. When a loop of wire is moved across a magnetic field, the current is produced in it is called

(a) Induced current (b) Photo electric current (c) Alternating current (d) Direct current

5. emf is induced due to change in:

a) Charge (b) Current (c) Magnetic Flux (d) Electric Flux

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

MCQs Related to the Article "15.2 MOTIONAL EMF"

1. The emf induced by motion of conductor across magnetic field is called

(a) Potential Difference (b) Electric potential (c) Variable emf (d) Motional emf

2. The relation of motional emf , when a conductor is move in perpendicular magnetic field, is:

(a) $\varepsilon = vBL$ (b) $\varepsilon = qBl$ (c) $\varepsilon = Blq$ (d) $\varepsilon = qvB$

3. If velocity of a conductor moving through a magnetic field B is made zero, then motional emf is:

(a) $-vBL$ (b) $-\frac{v}{BL}$ (c) Zero (d) $-\frac{BL}{v}$

4. Motional emf is directly proportional to:

(a) Velocity of conductor (b) Magnetic field strength
(c) Length of conductor (d) All a, b & c

5. The rod of unit length is moving at 30° through a magnetic field of 1 T. If velocity of the rod is $1\ ms^{-1}$, then induced emf in the rod will be given by:

(a) 1 V (b) 0.2 V (c) 0.5 V (d) 0.6 V

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

MCQs Related to the Article "15.3 FARADAY'S LAW OF INDUCED EMF"

1. The relation $\varepsilon = -N\frac{\Delta\phi}{\Delta t}$ is known as:

(a) Kirchoff's Rule (b) Ampere's Law (c) Faraday's Law (d) Coulomb's Law

2. The negative sign with induced emf is due to

(a) Faraday's law (b) Lenz's law (c) Ampere law (d) None

3. According to Faraday's law of electromagnetic induction, the induced emf is directly proportional to:

(a) Magnetic Flux (b) Induced Current
(c) Resistance of coil (d) Rate of change of magnetic flux

4. If we increase the resistance of the circuit containing a coil, the induced emf will be

(a) Increase (b) Decrease (c) Remain same (d) None

5. The product of induced current and resistance of the wire through which current is passing is equal to:

(a) Mutual Inductance (b) Induced emf (c) Self Inductance (d) Eddy Currents

6. The term $\frac{\Delta\phi}{\Delta t}$ has the same dimension as:

(a) Time (b) Current (c) Magnetic Flux (d) Resistance

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

MCQs Related to the Article "15.4 LENZ'S LAW AND DIRECTION OF INDUCED CURRENT"

1. **The direction of induced current is always so as to oppose the change which causes the current is called:**

(a) Faraday's law (b) Lenz's law (c) Ohm's law (d) Kirchhoff's rule

2. **Lenz's law is consistent with the law of conservation of:**

(a)Angular Momentum (b) Momentum (c) Energy (d) Charge

3. **Lenz's law deals with:**

(a) Magnitude of emf (b) Direction of emf
(c) Resistance (d) Direction of induced current

4. **If the magnetic flux through the circuit through the circuit is increasing, then induced emf acts to _____ the magnetic flux**

(a) Increase (b) Decrease (c) Zero (d) None of these

5. **If the magnetic flux through the circuit through the circuit is decreasing, then induced emf acts to _____ the magnetic flux.**

(a) Increase (b) Decrease (c) Zero (d) None of these

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

MCQs Related to the Article "15.5 MUTUAL INDUCTION"

1. **The phenominon in which changing current in one coil induces emf in other coil is called:**

(a) Self Induction (b) Mutual Induction (c) Motional emf (d) Magnetic Flux

2. **The mutual inductance b/w two coil is**

(a) $M = -\frac{\varepsilon_S}{\Delta I_P}$ (b) $M = -\frac{\varepsilon_S}{\left(\frac{\Delta I_P}{\Delta t}\right)}$ (c) $M = -\frac{\varepsilon_S}{\left(\frac{\Delta \phi}{\Delta t}\right)}$ (d) $M = -\frac{\left(\frac{\Delta I_P}{\Delta t}\right)}{\varepsilon_S}$

3. **Inductance is measure in:**

(a) Volt (b) Ampere (c) Ohms (d) Henry

4. **1 henry is equal to:**

(a) $1\ V\ A\ s^{-1}$ (b) $1\ V\ s\ A^{-1}$ (c) $1\ V\ m\ A^{-1}$ (d) $1\ V\ A\ m^{-1}$

5. **The application of mutual induction is a**

(a) Television (b) Radio (c) Transformer (d) D.C. motor

6. **The mutual induction between two coils depends upon:**

(a) area of the coils (b) distance b/w the coils (c) number of turns (d) all of these

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

MCQs Related to the Article "15.6 SELF INDUCTION"

1. **The phenomenon in which changing current in a coil induces an emf in itself is called:**

(a) Self Induction (b) Mutual Induction (c) Motional emf (d) Magnetic Flux

2. **The self-inductance may be defined by**

(a) $L = -\frac{\left(\frac{\Delta I}{\Delta t}\right)}{\varepsilon}$ (b) $L = -\frac{\varepsilon}{\left(\frac{\Delta I}{\Delta t}\right)}$ (c) $L = -\frac{\varepsilon}{\Delta I}$ (d) $L = -\frac{\Delta I}{\varepsilon}$

3. **The ratio of average induced emf to the rate of change of current in the coil is called:**

(a) Self inductance (b) Mutual inductance (c) Electric Flux (d) Current

4. **The notation for henry is:**

(a) $Vs^{-1}A^{-1}$ (b) $Vs^{-1}A$ (c) AsV^{-1} (d) VsA^{-1}

5. **The inductance is more in self induction in:**

(a) Air cored coil (b) Iron cored coil (c) Plastic cored coil (d) None of these

6. **Inductance of the coil can be increased by using _____ core:**

(a) Diamagnetic (b) Paramagnetic (c) Ferromagnetic (d) None of these

7. **Self-inductance of a coil depends upon:**

(a) Number of turns of coil (b) Area of coil (c) Core material (d) All a, b & c

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

MCQs Related to the Article "15.7 ENERGY STORED IN AN INDUCTOR"

1. **An inductor is a circuit element that can store energy in**

(a) Magnetic field (b) Electric flux (c) Electric field (d) None

2. **Magnetic potential energy stored in an inductor depends upon:**

(a) Square root of the value of current (b) Cube root of the value of current
(c) Square of the value of current (d) None of these

3. Energy stored in an inductor is:

(a) $\frac{1}{2}LI^2$ (b) $\frac{1}{2}LI$ (c) $\frac{1}{2}L^2I^2$ (d) $\frac{1}{2}LI$

4. The energy stored per unit volume inside a solenoid is calculated by:

(a) $\frac{B^2}{2\mu_0}(Al)$ (b) $\frac{B^2}{2\mu_0}$ (c) $\frac{\mu_0}{2B^2}(Al)$ (d) $\frac{\mu_0}{2B^2}$

5. If an inductor has N turns and ϕ is magnetic flux through its each turn when current I is flowing, then self-inductance L is given by formula:

(a) $\frac{I}{N\phi}$ (b) $N\phi$ (c) $\frac{N\phi}{I}$ (d) $N\phi I$

6. Self inductance of solenoid is:

(a) $L = \mu_0 nAl$ (b) $L = \mu_0 N^2 Al$ (c) $L = \mu_0 n^2 Al$ (d) $L = \mu_0 NAl$

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

MCQs Related to the Article "15.8 ALTERNATING CURRENT GENERATOR"

1. A generator converts mechanical energy into

(a) Chemical energy (b) Light energy (c) Heat energy (d) Electrical energy

2. The principle of an alternating current generator is based on:

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

3. Alternating current changes

(a) Its magnitude as well as direction (b) Only direction but not magnitude
(c) Only magnitude but not direction (d) None

4. The induced emf in A.C. generator is

(a) $vBL\sin\theta$ (b) $NAB\sin\theta$ (c) $N\omega AB\sin\theta$ (d) $NIAB\sin\theta$

5. Maximum emf generated in a generator is:

(a) $\varepsilon_0\sin\theta$ (b) $N\omega AB\sin\theta$ (c) $N\omega AB$ (d) None of these

6. Which one is not present in AC generator?

(a) Armature (b) Magnet (c) Slip Ring (d) Commutator

7. If the speed of rotation of a generator is doubled, the output voltage will be:

(a) Remains same (b) Double (c) Four times (d) One Half

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

MCQs Related to the Article "15.9 D.C. GENERATOR"

1. Which of the following is not present in AC generator:

(a) Armature (b) Magnet (c) Slip rings (d) Commutator

2. Who invented commutator?

(a) William Sturgeon (b) William Smith (c) Michael Faraday (d) Coulomb

3. The coil used in the generators is called

(a) Commutator (b) Slip rings (c) Armature (d) None

4. Commutator was invented in:

(a) 1820 (b) 1830 (c) 1834 (d) 1840

5. Which part of DC generator prevent the direction of current from changing:

(a) Carbon Brushes (b) Armature (c) Commutator (d) Poles of magnet

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

MCQs Related to the Article "15.10 BACK MOTOR EFFECT IN GENERATORS"

1. The back motor effect exist in the

(a) Generator (b) Motor (c) A.C. Motor (d) None

2. A device in a circuit that consumes electrical energy is known as:

(a) Resistance (b) Capacitance (c) Inductance (d) Load

3. The torque produced due to induced current in coil of generator that opposes coil's rotation is called:

(a) Back generator effect (b) Back motor effect (c) Mutual Inductance (d) Self Inductance

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

MCQs Related to the Article "15.11 D.C. MOTOR"

1. A device which converts electrical energy into mechanical energy is called:

(a) Transformer (b) AC generator (c) DC motor (d) DC generator

2. The back ward generator is called

(a) Electric motor (b) A.C. generator (c) Reverse generator (d) None

3. The working principle of D.C. motor is similar to

(a) Galvanometer (b) Rectifier (c) DC generator (d) Transformer

4. The jerks in DC motors are created by the use of:

(a) Commutator (b) Armature (c) Torque (d) Source

5. The winding of electromagnet in motor are usually called:

(a) Magnetic coils (b) Field coils (c) Electric coils (d) Induction coils

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

MCQs Related to the Article "15.12 BACK EMF EFFECT IN MOTORS"

1. Self-induced emf is sometimes called:

(a) Motional emf (b) Constant emf (c) Back emf (d) Variable emf

2. When a motor is just started, back emf is almost _____

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

3. An over loaded motor draws

(a) Max. current (b) Min. current (c) Half (d) None

4. When motor is at its Max. speed the back emf will be

(a) Maximum (b) Zero (c) Cannot tell (d) None of these

5. When back emf is zero, an electric motor draws:

(a) Zero current (b) Steady current (c) Minimum Current (d) Maximum Current

6. When back emf in the motor is maximum, it draws

(a) Zero current (b) Steady current (c) Minimum Current (d) Maximum Current

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

MCQs Related to the Article "15.13 TRANSFORMER"

1. The principle of transformer is

(a) Amperes law (b) Mutual induction (c) Motional emf (d) None

2. When constant current flows in primary of transformer, then the emf induced across secondary of transformer is:

(a) Zero (b) Constant (c) Alternating (d) Irregular

3. A transformer is a device which step up or stop down

(a) Energy (b) Power (c) Voltage (d) All of above

4. To construct a step down transformer:

(a) $N_S > N_P$ (b) $N_S < N_P$ (c) $N_S = N_P$ (d) $N_S \times N_P = 1$

5. To construct a step up transformer:

(a) $N_S > N_P$ (b) $N_S < N_P$ (c) $N_S = N_P$ (d) $N_S \times N_P = 1$

6. An ideal transformer obeys the law of conservation of:

(a) Flux (b) Momentum (c) Emf (d) Energy

7. The coil which is connected to input of a transformer is called:

(a) Primary (b) Secondary (c) Middle (d) None

8. In the actual transformer, the output is always

(a) Equal to input (b) Less then input (c) More than input (d) None

9. In ideal transformer when applied potential difference is double, the output current is:

(a) Doubled (b) Tripled (c) Halved (d) Same

10. Why is the core of a transformer made of iron?

(a) Iron is good conductor (b) Iron is cheaper than copper

(c) Iron can be magnetized or demagnetized easily (d) Iron makes good permanent magnet

11. For a good transformer the hysterics loop are _____ in size.

(a) Small (b) Large (c) Zero (d) None

12. To minimize the heating effect in the transmission lines

(a) High current, low voltage in used (b) High voltage, low current in used

(c) Same voltage and current in used (d) None

13. A step up transformer has primary voltage of 50 V D.C. the secondary voltage is:

(a) 20 V (b) 40 V (c) 220 V (d) 0 V

14. For an ideal transformer:

(a) *Output Power* > *Input Power* (b) *Output Power* < *Input Power*

(c) *Output Power* = *Input Power* (d) *Output Power* = $(Input\ Power)^2$

15. A laminated iron core is used in transformer and choke to

(a) Increase magnetic flux (b) Minimize eddy current losses

(c) To conduct current (d) All a, b & c

16. The power loss in transformer takes place due to:

(a) Eddy currents (b) Magnetic field (c) Hysteresis (d) Both a & c

17. The efficiency of transformer is given by:

(a) $\eta = \frac{Output\ Power}{Input\ Power} \times 100$ (b) $\eta = \frac{Input\ Power}{Output\ Power} \times 100$ (c) $Output\ Power \times 100$

18. The loss of power in transformer can be reduced by

(a) Using laminated sheets of core material (b) Decreasing the resistance of coil

(c) Proper coupling of primary and secondary coil (d) All a, b & c

19. In a transformer, which of the following quantities has same value in primary and secondary?

(a) Voltage (b) Current (c) Resistance (d) Rate of change of magnetic flux

20. The core of transformers is laminated to reduce:

(a) Magnetic Loss (b) Hysteresis Loss (c) Eddy current loss (d) Electric loss

MCQ # 1: (b)	MCQ # 2: (a)	MCQ # 3: (c)	MCQ # 4: (b)	MCQ # 5: (a)	MCQ # 6: (d)	MCQ # 7: (a)
MCQ # 8: (b)	MCQ # 9: (c)	MCQ # 10: (c)	MCQ # 11: (a)	MCQ # 12: (b)	MCQ # 13: (d)	MCQ # 14: (c)
MCQ # 15: b()	MCQ # 16: (d)	MCQ # 17: (a)	MCQ # 18: (d)	MCQ # 19 d)	MCQ # 20: (c)	

CHAPTER # 16

ALTERNATING CURRENT

MCQs Related to the Article "16.1 ALTERNATING CURRENT"

1. The instantaneous value of alternating voltage is

(a) $V = V_o \sin 2\pi ft$ (b) $V = V_o \sin 2ft$ (c) $V = V_o \sin 2\pi\omega t$ (d) $V = V_o \sin ft$

2. The most common source of alternating voltage is:

(a) Motor (b) Transformer (c) AC generator (d) None of these

3. The waveform of alternating voltage is:

(a) Cosine curve (b) Tangent curve (c) Cotangent Curve (d) Sine curve

4. The mean value of A.C. over a complete cycle in

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

5. The highest value reached by the voltage or current in one cycle is called:

(a) Instantaneous value (b)Peak to peak value

(c) Peak value (d) Root mean square value

6. If $V_{rms} = 10\sqrt{2}\ volts$, then phase voltage V_0 will be:

(a) 10 $volts$ (b) 20 $volts$ (c) 40 $volts$ (d) $\frac{10}{\sqrt{2}}\ volts$

7. If $I_{rms} = 10\ A$, then I_o will be equal to:

(a) 14.1 A (b) 1.41 A (c) 141 A (d) 0.141 a

8. The frequency of AC used in Pakistan is _____

(a) 60 CPS (b) 50 CPS (c) 100 CPS (d) 120 CPS

9. In case of phasor diagram the vector rotates

(a) Clockwise (b) Anti clockwise (c) Remain stationary (d) None

10. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50Hz source?

(a) 50 times (b) 100 times (c) 200 times (d) None of these

11. Phase corresponding to negative peak value is equal to:

(a) π (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) $\frac{3\pi}{2}$

MCQ # 1: (a)	MCQ # 2: (c)	MCQ # 3: (d)	MCQ # 4: (c)	MCQ # 5: (c)	MCQ # 6: (b)
MCQ # 7: (a)	MCQ # 8: (b)	MCQ # 9: (b)	MCQ # 10: (b)	MCQ # 11: (d)	

MCQs Related to the Article "16.2 A.C. CIRCUITS"

1. The basic circuit element of a DC circuit is:

(a) Battery (b) Resistor (c) Inductor (d) Capacitor

2. The basic circuit element of an AC circuit is:

(a) Resistor (b) Inductor (c) Capacitor (d) All a, b & c

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

MCQs Related to the Article "16.3 A.C. THROUGH A RESISTOR"

1. In pure resistive AC circuit, instantaneous value of voltage or current:

(a) Current lags behind voltage (b) Current leads voltage by $\frac{\pi}{2}$

(c) Both are in-phase (d) Voltage leads current by $\frac{\pi}{2}$

2. The behavior of resistance is frequency

(a) Dependent (b) Independent (c) No response (d) None of these

MCQ # 1: (c)	MCQ # 2: (b)

MCQs Related to the Article "16.4 A.C. THROUGH A CAPACITOR"

1. A capacitor is perfect insulator for:

(a) Alternating current (b) Direct current (c) Both a and b

2. At high frequency, the current through a capacitor of AC circuit will be:

(a) Large (b) Small (c) Infinite (d) Zero

3. The unit used for capacitive reactance is

(a) Volt (b) Ampere (c) Joule (d) Ohm

4. In case of capacitor, the voltage lags behind the current by

(a) 90^o (b) 60^o (c) 30^o (d) 180^o

5. The slope of q-t curve at any instant of time gives:

(a) Current (b) Voltage (c) Charge (d) Both a & b

6. The reactance of capacitor is equal to:

(a) ωC (b) $\frac{1}{\omega L}$ (c) $\frac{\omega}{L}$ (d) $\frac{1}{\omega C}$

7. If the frequency of A.C in large the reactance of capacitor is

(a) Large (b) Small (c) Zero (d) None

8. If the frequency of A.C. is doubled, the reactance of capacitor will be

(a) Half (b) Same (c) Double (d) Triple

9. 100 μF capacitor is connected to an alternating voltage of 24 V having frequency 50 Hz. The reactance of capacitor is:

(a) 30.8 Ω (b) 31.8 Ω (c) 34.8 Ω (d) 40 Ω

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

MCQs Related to the Article "16.5 A.C. THROUGH AN INDUCTOR"

1. A device that allows permits flow of DC through the circuit easily, is called:

(a) Inductor (b) Capacitor (c) AC generator (d) Transformer

2. The inductive reactance is:

(a) $X_L = \omega C$ (b) $X_L = \omega L$ (c) $X_L = \frac{1}{\omega C}$ (d) $X_L = \frac{1}{\omega L}$

3. In pure inductive circuit the voltage

(a) Remain same with current (b) Lag the current by 90°

(c) Lead the current by 90° (d) None

4. In the pure inductor the resistance is

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

5. The reactance of inductor is represented by

(a) X_C (b) R_C (c) R_L (d) X_L

6. By increasing the frequency of A.C. through an inductor the reactance will be

(a) Remain same (b) Decreases (c) Increases (d) None

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

MCQs Related to the Article "16.6 IMPEDANCE"

1. The combine opposition of resistor, capacitor and inductor is called

(a) Reactance (b) Resistor (c) Impedance (d) None

2. The SI unit of impedance is:

(a) Henry (b) Hertz (c) Ampere (d) Ohm

3. The impedance Z can be expressed as:

(a) $V_{rms} + I_{rms}$ (b) $V_{rms} - I_{rms}$ (c) V_{rms}/I_{rms} (d) I_{rms}/V_{rms}

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

MCQs Related to the Article "16.7 R-C AND R-L SERIES CIRCUIT"

1. The magnitude of impedance in RC circuit is:

(a) $Z = \frac{I}{\sqrt{R+\frac{1}{\omega C}}}$ (b) $Z = \frac{I}{\sqrt{R^2+\frac{1}{\omega^2 C^2}}}$ (c) $Z = \sqrt{R+\frac{1}{\omega C}}$ (d) $Z = \sqrt{R^2+\frac{1}{\omega^2 C^2}}$

2. The magnitude of impedance in RL circuit is:

(a) $Z = \sqrt{R^2 + X_L^2}$ (b) $Z = \frac{I}{\sqrt{R^2+X_L^2}}$ (c) $Z = R$ (d) None

3. For RC series A.C. circuit, the voltage leads the current by a phase angle of:

(a) $\theta = \tan^{-1}(\omega CR)$ (b) $\theta = \tan^{-1}\left(\frac{1}{\omega CR}\right)$ (c) $\theta = \tan^{-1}\left(\frac{\omega C}{R}\right)$ (d) $\theta = \tan^{-1}\left(\frac{R}{\omega C}\right)$

4. For RL series A.C. circuit, the voltage leads the current by a phase angle of:

(a) $\theta = \tan^{-1}(\omega LR)$ (b) $\theta = \tan^{-1}\left(\frac{1}{\omega LR}\right)$ (c) $\theta = \tan^{-1}\left(\frac{\omega L}{R}\right)$ (d) $\theta = \tan^{-1}\left(\frac{R}{\omega L}\right)$

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

MCQs Related to the Article "16.8 POWER IN A.C. CIRCUITS"

1. The power dissipation in AC circuit is given by: $P = V_{rms} I_{rms} \cos\theta$. In this expression, $\cos\theta$ is called:

(a) Phase factor (b) Gain factor (c) Loss factor (d) Power factor

2. Power dissipation in pure inductive or in a pure capacitive circuit is:

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

3. The circuit in which current and voltage are in phase, the power factor is:

(a) Zero (b) one (c) two (d) four

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

MCQs Related to the Article "16.9 SERIES RESONANCE CIRCUIT"

1. At resonance, the phase angle for RLC series resonance circuit equals:

(a) 0° (b) 90° (c) 180° (d) 270°

2. At resonance RLC series circuit shows the behavior of:

(a) Pure resistive circuit (b) Pure capacitive circuit
(c) Pure inductive circuit (d) Pure RLC circuit

3. In RLC series resonance circuit, at resonance frequency, the impedence Z is:

(a) $\sqrt{R^2 + X_C^2}$ (b) $\sqrt{R^2 + X_L^2}$ (c) R (d) X_L

4. At resonance, the value of current in RLC series circuit is equal to:

(a) $zero$ (b) $V_0 R$ (c) $\frac{I}{2}$ (d) $\frac{V_0}{R}$

5. In RLC series circit, the current at resonance frequency is:

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

6. The condition of resonance reached when

(a) $X_C > X_L$ (b) $X_L < X_C$ (c) $X_L = X_C$ (d) None of these

7. In RLC series AC circuit, when $X_L = X_C$ then impedance is

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

8. At resonance, the value of the power factor in an RLC series is

(a) Zero (b) ½ (c) 1 (d) Not defined

9. The angular frequency of resonance circuit is

(a) $\omega = \frac{1}{LC}$ (b) $\omega = \frac{1}{L\sqrt{C}}$ (c) $\omega = \frac{1}{\sqrt{LC}}$ (d) $\omega = \sqrt{LC}$

10. At higher frequencies, which of the following plays a dominant role in RLC series circuit

(a) Resistor (b) Inductor (c) Capacitor (d) Transistor

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

MCQs Related to the Article "16.10 PARALLEL RESONANCE CIRCUIT"

1. In parallel RLC circuit , at resonance frequency, there will be maximum

(a) Power (b) Voltage (c) Impedance (d) None

2. Natural or Resonant frequency of an LC circuit is

(a) $\frac{1}{2\pi(LC)}$ (b) $\frac{1}{2\pi\sqrt{LC}}$ (c) $2\pi\sqrt{LC}$ (d) $2\pi(LC)$

3. Rejector circuits is:

(a) Parallel Resonance Circuit (b) Series Resonance Circuit
(c) RC Series Circuit (d) RL Series Circuit

4. At resonance frequency the power factor is

(a) One (b) Zero (c) Two (d) Three

5 For Parallel Resonance circuit at resonant frequency, the circuit current is:

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

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

MCQs Related to the Article "16.11 THREE PHASE A.C. SUPPLY"

1. The phase difference between each pair of coils of a three phase AC generator is:

(a) 0° (b) 90° (c) 120° (d) 180°

2. Three phase AC machine has

(a) 4 terminals (b) No terminal (c) 2 Terminals (d) 6 terminals

3. In three phase voltage across any two lines is about:

(a) 220 V (b) 230 V (c) 440 V (d) 400 V

4. The main advantage of having three phase supply is that the total load of the house or a factory is divided into:

(a) 2 parts (b) 3 parts (c) 4 parts (d) 5 parts

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

MCQs Related to the Article "16.12 PRINCIPLE OF METAL DETECTORS"

1. A coil and a capacitor are electrical component connected parallel form:

(a) Rectifier (b) Oscillator (c) Choke (d) Detector

2. Metal Detector consists of:

(a) Rectifier (b) Transistor (c) LC Oscillator (d) None of these

3. The electrical oscillators are used in

(a) Metal detectors (b) Amplifier (c) Diode (d) None

4. In metal detector, the energy oscillates between

(a) Resistor and Capacitor (b) Resistor and Inductor

(c) Capacitor and Inductor (d) None of these

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

MCQs Related to the Article "16.13 CHOKE"

1. Resistance of choke is:

(a) Zero (b) Very small (c) Large (d) Infinite

2. Pure choke consumes:

(a) Minimum Power (b) Maximum Power (c) No Power (d) Average Power

3. The choke coil is used in:

(a) DC circuits (b) AC circuits (c) Both a & b (d) None of these

MCQ # 1: (b)	MCQ # 2: (c)	MCQ # 3: (b)

MCQs Related to the Article "16.14 ELECTROMAGNETIC WAVES"

1. The waves

(a) Matter wave (b) Mechanical wave (c) Electromagnetic wave (d) Transverse wave

2. Electromagnetic waves transport:

(a) Energy (b) Mass (c) Current (d) Charge

3. Which of the follo wing requires a material medium for their propagation:

(a) Heat waves (b) x-rays (c) sound waves (d) ultravoilot rays

4. X-rays have wavelength of the order of:

(a) $10^{-4}m$ (b) $10^{-5}m$ (c) $10^{-10}m$ (d) $10^{-2}m$

5. Which of the following are more energetic?

(a) Radio Waves (b) Infrared Waves (c) Ultraviolet Waves (d) Gamma Waves

6. In electromagnetic waves, the electric, magnetic fields and propagation of waves are:

(a) Parallel (b) Perpendicular (c) Make 45° angle (d) Anti-Parallel

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

MCQs Related to the Article "16.15 PRINCIPLE OF GENERATION, TRANSMISSION & RECEPTION OF ELECTROMAGNETIC WAVES"

1. By moving an electrically charged objects to & fro produces:

(a) Stationary Waves (b) Mechanical Waves (c) Electromagnetic waves (d) Sound waves

2. Which of circuit is used in radio set?

(a) RC circuit (b) RL circuit (c) LC circuit (d) RLC circuit

3. A radio transmitting antenna generate electromagnetic waves by:

(a) Stationary charges (b) Accelerating Charges (c) Both a & b (d) None of these

4. A changing electric flux creates:

(a) Electric field (b) Gravitational Field

(c) Magnetic Field (d) Electric Field

5. Electrons vibration 94000 times each second will produce radio waves of frequency:

(a) 94 Hz (b) 940 Hz (c) 940 kHz (d) 94 kHz

6. Electromagnetic waves emitted from radio antenna are _____ waves:

(a) Stationary (b) Longitudenal (c) Transverse (d) Matter

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

MCQs Related to the Article "16.16 MODULATION"

1. The process combining low frequency signal with high frequency radio wave is called:

(a) Modulation (b) Amplification (c) Demodulation (d) Resonance

2. There are _____ types of modulations:

(a) 1 (b) 2 (c) 3 (d) 4

3. **Low frequency signal is known as:**

(a) Loaded signal (b) Fluctuated signal (c) Harmonic signal (d) Modulating signal

4. A.M stands for

(a) Applied Metal (b) Amplitude Modulation (c) Accurate Measurement (d) None

5. The AM transmission waves have frequency range of:

(a) 540Hz-1600Hz (b) 540kHz-1600 kHz (c) 540Hz-1600MHz (d) 88 MHz-108 MHz

6. F.M stands for

(a) Frequency Metal (b) Frequency Member (c) Frequency Modulation (d)None

7. The FM transmission waves have frequency range of:

(a) 540Hz-1600Hz (b) 540kHz-1600 kHz (c) 540Hz-1600MHz (d) 88 MHz-108 MHz

8. In modulation, high frequency radio wave is called:

(a) Fluctuated wave (b) Carrier wave (c) Matter wave (d) Energetic wave

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

CHAPTER # 17
PHYSICS OF SOLIDS

MCQs Related to the Article "17.1 CLASSIFICATIONS OF SOLIDS"

1. Solids having regular a arrangement of molecules through its structure is called:
(a) Amorphous Solids (b) Polymeric Solids (c) Glassy Solids (d) Crystalline Solids

2. Which type of solids have definite melting point:
(a) Crystalline Solids (b) Amorphous Solids (c) Polymeric Solids (d) Glassy Solids

3. Which of the following is an example crystalline solids:
(a) Plastic (b) Zirconia (c) Glass (d) Nylon

4. The arrangement of atoms, ions or molecules in crystalline solids can be studied by:
(a) Radio Waves (b) Infrared Waves (c) X-rays (d) Ultraviolet Rays

5. Formation of large molecule by joining small molecules is _____
(a) Fusion (b) Polymerization (c) Crystallization (d) Subtraction

6. Example of crystalline solids are also
(a) Metals (b) Ionic compounds (c) Ceramics (d) All of them

7. The crystal structure of NaCl is:
(a) Triclinic (b) Monoclinic (c) Cubic (d) Tetragonal

8. Amorphous solids are also called:
(a) Polymeric Solids (b) Glassy Solids (c) Crystalline Solids (d) Brittle Solids

9. Which of the following is polymeric solid:
(a) Glass (b) Iron (c) Steel (d) Nylon

10. The solids that are intermediate between order and disorder are called
(a) Polymeric Solids (b) Glassy Solids (c) Crystalline Solids (d) Ductile Solids

11. How many crystal systems are there on the basis of geometric arrangement of the atoms:
(a) 3 (b) 4 (c) 5 (d) 7

MCQ # 1: (d)	MCQ # 2: (a)	MCQ # 3: (b)	MCQ # 4: (c)	MCQ # 5: (b)	MCQ # 6: (d)
MCQ # 7: (c)	MCQ # 8: (b)	MCQ # 9: (d)	MCQ # 10: (a)	MCQ # 11: (d)	

MCQs Related to the Article "17.2 MECHANICAL PROPERTIES OF SOLIDS"

1. Any alteration produced in shapes, length or volume when a body is subjected to some external force is called _____
(a) Stiffness (b) Ductility (c) Extension (d) deformation

2. The SI unit of stress is same as that of:
(a) Momentum (b) Pressure (c) Force (d) Length

3. The stress that produces change in length is known as:
(a) Tensile stress (b) Shear stress (c) Volumetic stress (d) Longitudenal stress

4. The stress that produces change in shape is known as:
(a) Tensile stress (b) Shear stress (c) Volumetic stress (d) Longitudenal stress

5. Which one of the following physical quantities does not have the dimensions of force per unit?
(a) Stress (b) Strains (c) Young's modulus (d) Pressure

6. unit of strain is:
(a) $\frac{N}{m^2}$ (b) $\frac{N}{m}$ (c) $N\,m$ (d) $no\ unit$

7. The ratio of applied stress to volumetric strain is called:
(a) Young's modulus (b) Shear modulus (c) Bulk modulus (d) Tensile modulus

8. The amount of energy stored in the wire when it is deformed:
(a) $U = \frac{1}{2}F_1 l_1$ (b) $U = \frac{1}{2}F_1^2 l_1$ (c) $U = \frac{1}{2}F_1 l_1^2$ (d) $U = \frac{1}{2}F_1^2 l_1^2$

9. The strain energy can be determined by calculating area under:
(a) Velocity-time graph (b) Force-velocity graph (c) Force-Extension graph

10. Which of the following is an example of ductile substances:
(a) Lead (b) Copper (c) Glass (d) Lead and copper

11. Substances which break just after the elastic limit is reached are called:
(a) Ductile substances (b) Hard substances (c) Soft substances (d) Brittle substances

12. The maximum stress which a body can bear is called
(a) Proportional Limit (b) Elastic Limit (c) Permanent Stress (d) Ultimate Tensile Stress

13. Materials that undergo plastic deformation before breaking are called _____
(a) Brittle (b) Ductile (c) Amorphous (d) Polymers

14. Examples of brittle substances are

(a) Glass (b) Copper (c) Lead (d) None

MCQ # 1: (d)	MCQ # 2: (b)	MCQ # 3: (a)	MCQ # 4: (b)	MCQ # 5: (b)	MCQ # 6: (d)
MCQ # 7: (c)	MCQ # 8: (a)	MCQ # 9: (c)	MCQ # 10: (d)	MCQ # 11: (d)	MCQ # 12: (d)
MCQ # 13: (b)	MCQ # 14: (a)				

MCQs Related to the Article "17.3 ELECTRICAL PROPERTIES OF SOLIDS"

1. The band theory of solids explains satisfactorily the nature of

(a) Electrical insulators alone (b) Electrical conductors alone
(c) Electrical semi conductors alone (d) All of the above

2. Which one has the greatest energy gap _____

(a) Semi-conductors (b) Conductors (c) Insulators (d) Metals

3. A well known example of an intrinsic semi-conductor is:

(a) Germanium (b) Phosphorous (c) Aluminum (d) Cobalt

4. Holes can exist in:

(a) Super conductors (b) Conductors (c) Semi-conductors (d) Insulators

5. Germanium is:

(a) semi-conductor (b) conductor (c) insulator (d) none of these

6. The substances having negative temperature coefficient of resistance are:

(a) Conductors (b) Insulators (c) Semi-Conductor (d) None Of These

7. Good conductors have conductivities of the order of:

(a) $10^{-7}\ (\Omega - m)^{-1}$ (b) $10^{7}\ (\Omega - m)^{-1}$ (c) $10^{2}\ (\Omega - m)^{-1}$ (d) $10^{-2}\ (\Omega - m)^{-1}$

8. At $0°K$ piece of Ge or Si is a perfect:

(a) Conductors (b) Insulators (c) Semi-Conductor (d) Paramagnetic

9. A vacant or partially filled band is called _____

(a) Conduction band (b) Valence band (c) Forbidden band (d) Empty band

10. A completely filled or partially filled band is called _____

(a) Conduction band (b) Valence band (c) Forbidden band (d) Core band

11. A substance having empty conduction band is called:

(a) Semi-conductor (b) Conductor (c) Insulator (d) None of these

12. Pentavalent impurities are called

(a) Donor impurities (b) Acceptor impurities (c) None of these

13. Minority carriers in N-type materials are

(a) Electrons (b) Protons (c) Neutrons (d) Holes

14. What type of impurity is to be added to the semi-condutor material to provide holes:

(a) Monovalent (b) Trivalent (c) Tetravalent (d) Pentavalent

15. Holes can exists in_____

(a) Conductors (b) Insulators (c) Semi conductors (d) All of the above

16. In a semi conductors, the charge carriers are _____

(a) Holes only (b) Electrons only (c) Both Electrons and Holes

17. The net charge on N-type material is _____

(a) Positive (b) Negative (c) Both a & b (d) Zero

18. Total current in semiconductor is:

(a) Electronic Current (b) Current due to Hole (c) Both a & b

MCQ # 1: (d)	MCQ # 2: (c)	MCQ # 3: (a)	MCQ # 4: (c)	MCQ # 5: (a)	MCQ # 6: (c)
MCQ # 7: (b)	MCQ # 8: (b)	MCQ # 9: (a)	MCQ # 10: (b)	MCQ # 11: (c)	MCQ # 12: (a)
MCQ # 13: (d)	MCQ # 14: (c)	MCQ # 15: (c)	MCQ # 16: (c)	MCQ # 17: (d)	MCQ # 18: (c)

MCQs Related to the Article "17.4 SUPERCONDUCTORS"

1. The temperature below at which materials lose its resistivity is called _____Temperature

(a) Super (b) Kelvin (c) Critical (d) Curie

2. The critical temperature for mercury is:

(a) 7.2 K (b) 4.2 K (c) 1.18 K (d) 3.7 K

3. The critical temperature of Lead is:

(a) 7.2 K (b) 4.2 K (c) 1.18 K (d) 3.7 K

4. The temperature 77 K is the

(a) Melting point of Nitrogen (b) Boiling Point of Nitrogen
(c) Melting point of Helium (d) Boiling Point of Helium

5. The practical use of superconductors is:

(a) Fast computer chips (b) Magnetic Resonance Levitation Trains
(d) Power but small electric motors (d) All of these

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

MCQs Related to the Article "17.5 MAGNETIC PROPERTIES OF SOLIDS"

1. The magnetism produced by electrons within an atom is due to

(a) Spin motion (b) Orbital motion (c) Spin & orbital motion

2. The field of long bar magnet is like a current carrying

(a) Solenoid (b) Toroid (c) Loop (d) None

3. Substances in which resultant magnetic moment is zero are called

(a) Ferromagnetic (b) Paramagnetic (c) Diamagnetic (d) Conductor

4. The examples of diamagnetic are

(a) Water (b) Copper (c) Antimony (d) All of them

5. The substances in which atoms cooperate with each other in such a way so as to exhibit strong magnetic field are called:

(a) Diamagnetic (b) Paramagnetic (c) Ferromagnetic (d) Insulators

6. Domains contain atoms:

(a) 10^3 to 10^6 (b) 10^6 to 10^9 (c) 10^9 to 10^{12} (d) 10^{12} to 10^{16}

7. Curie temperature for iron is:

(a) 0 ℃ (b) 570 ℃ (c) 750 ℃ (d) 1025 ℃

8. Above curie temperature iron is:

(a) Diamagnetic (b) Paramagnetic (c) Ferromagnetic (d) Superconductor

9. Magnetization lags behind magnetizing current, this phenomenon is known as:

(a) Diamagnetism (b) Coercively (c) Susceptibility (d) Hysterisis

10. A current which demagnetize the material completely is called

(a) Applied current (b) Coercive current (c) Maximum current (d) None of these

11. The energy need to magnetize and demagnetize the specimen during the each cycle of magnetizing current is

(a) Value of current (b) Value of demagnetizing current
(c) Value of magnetic flux density (d) Area of the loop

12. Best hard magnetic materials is made up of:

(a) Alnico V (b) Iron (c) Nickel (d) Cobalt

MCQ # 1: (c)	MCQ # 2: (a)	MCQ # 3: (c)	MCQ # 4: (d)	MCQ # 5: (c)	MCQ # 6: (d)
MCQ # 7: (c)	MCQ # 8: (b)	MCQ # 9: (d)	MCQ # 10: (b)	MCQ # 11: (d)	MCQ # 12: (a)

CHAPTER # 18
ELECTRONICS

MCQs Related to Article "18.1 BRIEF REVIEW OF PN-JUNCTION AND ITS CHARACTERISTICS"

PN-JUNCTION

1. A potential barrier of 0.7 v exist across the pn-junction made from:
(a) Indium (b) germinium (c) Silicon (d) gallium

2. Which type of impurity is to be added to a pure semi-conductor crystal to provide holes
(a) Monovalent (b) Trivalent (c) Pentavalent (d) Tetravalent

3. The potential difference across the depletion region of germanium at 300 K is
(a) 0.5 V (b) 0.6 V (c) 0.7 V (d) 0.3 V

4. In n-type materials, the Minority carriers are:
(a) Free electrons (b) Holes (c) Protons (d) Meson

5. Diode is a device which has _____ terminals.
(a) One (b) Two (c) Three (d) Four

BIASING

6. When a pn-junction is reverse biased, the depletion region is:
(a) Widened (b) Narrowed (c) Normal (d) No change

7. The forward current through a semiconductor diode circuit is due to
(a) Minority carriers (b) Majority carriers (c) Holes (d) Electrons

8. The reverse current in a p-n junction flows due to
(a) Minority carriers (b) Majority carriers (c) Holes (d) Electrons

9. The reverse current through pn-junction is:
(a) Zero (b)Less than forward current (c) Greater than forward current

10. The reverse or leakage current of the diode is of the order of
(a) Microampere (b) Milli-ampere (c) Both (d) None of these

11. Pulsating DC can be made smooth by using a circuit known as:
(a) Filter (b) Tank (c) Acceptor (d) Rejecter

MCQ # 1: (c)	MCQ # 2: (b)	MCQ # 3: (d)	MCQ # 4: (b)	MCQ # 5: (b)	MCQ # 6: (a)
MCQ # 7: (b)	MCQ # 8: (a)	MCQ # 9: (b)	MCQ # 10: (a)	MCQ # 11: (a)	

MCQs Related to Article "18.2 RECTIFICATION"

1. AC can be converted to DC by:
(a) Transformer (b) Generator (c) Motor (d) Rectifier

2. The process in which only half cycle of AC signal is converted to DC is called:
(a) Filtration (b) Half wave Rectification (c) Full wave Rectification

3. The number of diodes in a half wave rectifier:
(a) 2 (b) 3 (c) 4 (d) 1

4. The process in which complete cycle of AC signal is converted to DC is called:
(a) Filtration (b) Half wave Rectification (c) Full wave Rectification

5. The number of diodes in a bridge rectifier is:
(a) 2 (b) 3 (c) 4 (d) 1

6. In a full wave rectifier, the diodes conducts during:
(a) Both halves of the input cycle (b) A portion of the positive half of the input cycle
(c) One half of the input cycle (d) A portion of the negative half of the input cycle

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

MCQs Related to Article "18.3 SPECIALLY DESIGNED P-N JUNCTIONS"

1. The color of light emitted by led depends on
(a) Its forward biased (b) Its reversed biased
(c) The amount of forward current (d) Type of semi-conductor material used

2. A LED emits lights only when it is:
(a) Forward biased (b) Reverse biased (c) Un biased (d) None of these

3. A pn junction photodiode is
(a) Operated in forward direction (b) Operated in reversed direction
(c) A very fast photo detector (d) Dependent on thermally generated carriers

4. A photo – diode can switch its current on and off in
(a) Milli seconds (b) Micro seconds (c) Nano seconds (d) None

5. A sensor of light is:
(a) Transistor (b) LED (c) Photo Diode (d) None of these

6. In photovoltaic cell, current is directly proportional to:
(a) Interference of light (b) Intensity of light (c) Frequency of light (d) Energy

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

MCQs Related to Article "18.4 TRANSISTOR"

1. The central region of a transistor is called:
(a) Collector (b) Emitter (c) Base (d) Neutral

2. The term transistor means:
(a) Transfer of current (b) Transfer of heat (c) Transfer of heat (d) Transfer of voltage

3. The transistor are made from
(a) Plastic (b) Metals (c) Insulators (d) Doped semiconductors

4. Transistor has:
(a) 2 regions (b) 3 regions (c) 4 regions (d) 1 region

5. Transistor is a device which has _____ terminals.
(a) One (b) Two (c) Three (d) Four

6. Base of the transistor is very thin of the order of:
(a) $10^{-2}\ m$ (b) $10^{-4}\ m$ (c) $10^{-6}\ m$ (d) $10^{-8}\ m$

7. The SI unit of current gain is:
(a) Ampere (b) Volt (c) Coulomb (d) No unit

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

MCQs Related to Article "18.5 TRANSISTOR AS AN AMPLIFIER"

1. A device which converts low voltage or current to high voltage or current is called:
(a) Transformer (b) AC-generator (c) Rectifier (d) Amplifier

2. For typical transistor as an amplifier, the voltage gain:
(a) $\frac{\Delta V_o}{\Delta V_{in}} = \frac{\beta\ R_c}{r_{ie}}$ (b) $\frac{\Delta V_o}{\Delta V_{in}} = \beta$ (c) $\frac{\Delta V_o}{\Delta V_{in}} = \frac{\beta\ r_{ie}}{R_c}$ (d) None of these

3. An expression for current gain of a transistor is given by:
(a) $\beta = \frac{I_B}{I_C}$ (b) $\beta = I_B - I_C$ (c) $\beta = I_B + I_C$ (d) $\beta = \frac{I_C}{I_B}$

4. The gain of transistor amplifier depends upon:
(a) Resistance connected with emitter (b) Resistance connected with collector
(c) Resistance connected with base (d) None of these

5. Which of the following is true for a transistor:
(a) $I_E = I_B - I_C$ (b) $I_E = I_C - I_B$ (c) $I_E = I_B + I_C$ (d) $I_E = \frac{I_B}{I_C}$

6. Transistor can be used as
(a) Oscillators (b) Switches (c) Memory unit (d) All of them

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

MCQs Related to Article "18.7 OPERATIONAL AMPLIFIERS"

1. A complete amplifier circuit made on a silicon chip and enclosed in a small capsule is called:
(a) Diode (b) (c) Resistor (d) Operational amplifier

2. The open loop gain of an operational amplifier is of the order of
(a) 10^8 (b) 10^5 (c) 10^2 (d) 10^{-3}

3. The resistance between + ive and – ive inputs of op – amplifier is
(a) 100 Ω (b) 1000 Ω (c) 10^6 Ω (d) None of these

4. Output resistance of an op-amp is
(a) High (b) Zero (c) Low (d) Equal to input resistance

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

MCQs Related to Article "18.8 OP-AMP AS INVERTING AMPLIFIER"

1. An op-amp will act as an inverting amplifier, when input signal is connected to:
(a) Inverting Terminal (b) Non-Inverting Terminal (c) Output Terminal

2. The gain G of inverting operational amplifier is:
(a) $G = -\frac{R_2}{R_1}$ (b) $G = 1 + \frac{R_2}{R_1}$ (c) $G = \frac{R_2}{R_1}$ (d) $G = 1 - \frac{R_2}{R_1}$

3. The gain of inverting op-amp depends on
(a) Internal Resistance (b) External Resistances (c) Potential Difference (d) Current

4. The negative sign in the expression of voltage gain for an inverting amplifier indicates that output signal is:
(a) In-phase with input signal (b) Out of phase with input signal
(c) Perpendicular to input signal (d) None of these

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

MCQs Related to Article "18.9 OP-AMP AS NON-INVERTING AMPLIFIER"

1. The gain G of non-inverting operational amplifier is:
(a) $G = -\frac{R_2}{R_1}$ (b) $G = 1 + \frac{R_2}{R_1}$ (c) $G = \frac{R_2}{R_1}$ (d) $G = 1 - \frac{R_2}{R_1}$

2. **For non-inverting amplifier, if $R_1 = \infty\ \Omega$ and $R_1 = 0\ \Omega$, then the gain of amplifier is**

(a) -1 (b) 0 (c) 1 (d) ∞

3. **An operational amplifier will act as a non-inverting amplifier when alternaing signal is applied at:**

(a) Inverting terminal (b) Non-Inverting terminal (c) Output resistance (d) Both a & b

4. **The gain of non-inverting op-amp depends on**

(a) Internal Resistance (b) External Resistances (c) Potential Difference (d) Current

5. **The positive sign in the expression of voltage gain for an inverting amplifier indicates that output signal is:**

(a) In-phase with input signal (b) Out of phase with input signal
(c) Perpendicular to input signal (d) None of these

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

MCQs Related to Article "18.10 OP-AMP AS A COMPARATOR"

1. **The conduction to saturation of an operational amplifier help us to:**

(a) Comparing two resistors (b) Comparing two voltages (c) Comparing two currents

2. **When op-amp is saturated, then**

(a) $V_o > V_{CC}$ (b) $V_o < V_{CC}$ (c) $V_o \neq V_{CC}$ (d) $V_o = V_{CC}$

MCQ # 1: (b)	MCQ # 2: (c)

MCQs Related to Article "18.11 COMPARATOR AS A NIGHT SWITCH"

1. **The automatic working of street lights is due to**

(a) Inductor (b) Capacitor (c) Comparator (d) Rectifier

2. **LDR is abbreviated for:**

(a) Light dependent resistor (b) light depositing resistor
(c) Light doped resistor (d) all of these

3. **The use of LDR is in the circuit of:**

(a) Night Switch (b) Logic Gates (c) Rectifier (d) Oscillator

4. **The value of LDR depends upon:**

(a) Intensity of sound (b) Intensity of heat (c) Intensity of light (d) Current

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

MCQs Related to Article "18.12 DIGITAL SYSTEMS"

1. **A system which deals with quantities or variables which have only two discrete values or states is known as**

(a) Octa system (b) Hexa system (c) Digital System (d) Decimal System

2. **Which is not a basic logic operation:**

(a) OR operation (b) AND operation (c) NOT operation (d) NAND operation

3. **The electronic circuits which implement the various logic operations are known as**

(a) Digital gates (b) Logic gate (c) Voltage operated gate (d) All of them

4. **In describing functions of digital systems, lighted bulb will be described as**

(a) Infinity (b) 0 (c) 1 (d) None of these

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

MCQs Related to Article "18.13 FUNDAMENTAL LOGIC GATES"

1. **Truth table of logic function:**

(a) Summarizes output values (b) Tabulate all input values
(c) Display all input and output possibilities (d) is not based on logic algebra

2. **The boolean expression X = A + B represents the logic operation of**

(a) NAND gate (b) OR gate (c) NOR gate (d) NOT gate

3. **The output of a two inputs OR gate is 0 only when its**

(a) Both inputs are 0 (b) Either input is 1 (c) Both inputs are 1 (d) Either input is zero

4. **The output of AND gate is 1 when**

(a) Both inputs are at 0 (b) either one input is at 1
(c) Both inputs are at 1 (d) none of these

5. **The only function of a NOT gate is to**

(a) Stop a signal (b) Re-complement a signal (c) Invert an input signal

6. **NOT gate has only**

(a) One input (b) Two inputs (c) Many inputs (d) None

7. **The term invertor is used for:**

(a) NOR Gate (b) NAND Gate (c) NOT Gate (d) OR Gate

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

MCQs Related to Article "18.14 OTHER LOGIC GATES"

1. In NOR gate 1 + 1 = _____

(a) 0 (b) 2 (c) 1 (d) 3

2. $X = \overline{A + B}$ is the mathematical notation for:

(a) OR gate (b) AND gate (c) NOR gate (d) NAND gate

3. NAND gate with two inputs a and b has output 0, if

(a) A is 0 (b) b is 0 (c) both a and b are 0 (d) both a and b are 1

4. NAND gate is a combination

(a) AND gate and NOT gate (b) AND gate and OR gate
(c) OR gate and NOT gate (d) NOT gate and NOT gate

5. An XOR gate produces an positive logic output only when its two inputs are

(a) High (b) Low (c) Different (d) Same

6. Temperature, pressure etc are converted into electronic information by devices called

(a) LEDs (b) Sensors (c) Vacuum tubes (d) None

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

CHAPTER # 19
DAWN OF MODERN PHYSICS

MCQs Related to the Article "19.1 RELATIVE MOTION"

The physics which deals best with behavior of microscopic particles moving with the speed of light is called:

(a) Microscopic Physics (b) Relativistic Mechanics
(c) Newtonian Mechanics (d) Classical Physics

MCQ # 1: (b)

MCQs Related to the Article "19.2 FRAMES OF REFERENCE"

1. **All motions are**

(a) Absolute (b) Uniform (c) Relative (d) Variable

2. **A coordinate system relative to which measurement are taken is known as:**

(a) Frame of reference (b) Infinity Point (c) Zero point (d) None of these

3. **A coordinate system in which a body moves with constant velocity as long as no force is acting on it is called**

(a) Accelerated frame of reference (b) Inertial frame of reference
(c) Non-inertial frame of reference (d) None of these

4. **The coordinate system in which law of inertia is valid is called:**

(a) Special frame of reference (b) Inertial frame of reference
(c) Non-Inertial frame of reference (d) Standard frame of reference

5. **Non-Inertial frame of reference has:**

(a) Zero Acceleration (b) Non-Zero Acceleration

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

MCQs Related to the Article "19.3 SPECIAL THEORY OF RELATIVITY"

1. **In 1905, the special theory of relativity was proposed by**

(a) Maxwell (b) De Broglie (c) Bohr (d) Einstein

2. **An observer shoots parallel to a meter stick at very high speed (relativistic) and finds that the length of meter stick is _____**

(a) Greater than one meter (b) Less than one meter
(c) One meter (d) None of these

3. **Using relativistic effects, the location of an aircraft after an hour's flight can be predicted about**

(a) 20 m (b) 50 m (c) 760 m (d) 780 m

4. **1 kg mass will be equivalent to energy:**

(a) $9 \times 10^8 J$ (b) $9 \times 10^{12} J$ (c) $9 \times 10^{16} J$ (d) $9 \times 10^{20} J$

5. **The special theory of relativity is based on:**

(a) 1 postulate (b) 2 postulates (c) 3 postulates (d) 4 postulates

6. **The velocity at which the mass of the body becomes double is:**

(a) $\frac{\sqrt{3}}{2}c$ (b) $\frac{2}{\sqrt{3}}c$ (c) $\frac{\sqrt{3}}{4}c$ (d) c

7. **If the object moves with speed of light, its mass become:**

(a) Zero (b) Infinity (c) Remain same (d) Decreases

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

MCQs Related to the Article "19.4 BLACK BODY RADIATION"

1. **Energy of black body radiation depends upon:**

(a) Nature of the surface of body (b) Nature of material of the body
(c) Shape and size of the body (d) Temperature of the body

2. **When Platinum is heated, it becomes cherry red at:**

(a) 500°C (b) 900°C (c) 1100°C (d) 1300°C

3. **When Platinum is heated, it becomes orange at:**

(a) 500°C (b) 900°C (c) 1100°C (d) 1300°C

4. **Platinum wire becomes yellow at temperature of:**

(a) 900°C (b) 1100°C (c) 1300°C (d) 1600°C

5. **When Platinum is heated, it becomes white at:**

(a) 900°C (b) 1100°C (c) 1300°C (d) 1600°C

6. The relation $\lambda_{max}T = Constant$ is known as

(a) Wein's Law (b) Plank's Law (c) Stephen Law (d) None

7. As the temperature of black body is raised, the wavelength corresponding to maximum intensity

(a) Shifts towards longer wavelength (b) Shifts towards shorter wavelength
(c) Remains the same (d) None of these

8. The energy radiated is directly proportional to fourth power of Kelvin's temperature is ____

(a) Karl-wein's laws (b) Raleigh jeans law (c) Stephens law (d) Planck's

9. According to Stephen's law about black body radiations:

(a) $E \propto \frac{1}{T^2}$ (b) $E \propto T^2$ (c) $E \propto T^4$ (d) $E \propto T$

10. At low temperature, a body is usually emits radiation of:

(a) Long wavelength (b) Short Wavelength (c) Infinite Wavelength (d) None of these

11. The name of photon for quantum of light was proposed by

(a) Ampere (b) Planck's (c) Thomson (d) Einstein

12. The units of Plank's constant are same as that of:

(a) Energy (b) Power (c) Angular frequency (d) Angular momentum

13. The value of Plank's constant h is equal to:

(a) $6.63 \times 10^{-34}\ Js$ (b) $6.63 \times 10^{-30}\ Js$ (c) $6.63 \times 10^{-31}\ Js$ (d) $6.63 \times 10^{34}\ Js$

14. Linear momentum of a photon is

(a) Zero (b) hf/c (c) hf/c (d) c

MCQ # 1: (d)	**MCQ # 2: (b)**	**MCQ # 3: (c)**	**MCQ # 4: (c)**	**MCQ # 5: (d)**	**MCQ # 6: (a)**	**MCQ # 7: (b)**
MCQ # 8: (c)	**MCQ # 9: (c)**	**MCQ # 10: (a)**	**MCQ # 11: (d)**	**MCQ # 12: (d)**	**MCQ # 13: (a)**	**MCQ # 14: (b)**

MCQs Related to the Article "PHOTOELECTRIC EFFECT"

1. The light of suitable frequency falling on metal surface ejects electrons, this phenomenon is called

(a) X-ray emission (b) Compton effect (c) Photoelectric effect (d) Nuclear fission

2. Photoelectric effect was explained by

(a) Hertz (b) Einstein (c) Rutherford (d) Bohr

3. In order to increase the K.E of ejected photoelectrons, there should be an increase in:

(a) Frequency of light (b) Intensity of light (c) Both a & b (d) None of these

4. The amount of energy required to eject an electron from metal surface is called:

(a) Threshold frequency (b) Work function (c) Compton Shift (d) Pair production

5. Photon 'A' has twice the energy of photon 'B'. What is the ratio of the momentum of 'A' to that of 'B'?

(a) 4 : 1 (b) 8 : 1 (c) 1 : 2 (d) 2 : 1

6. Stopping potential for a metal surface in case of photo electric emission depends on

(a) The threshold frequency for the metal surface (b) The intensity of incident light
(c) The frequency of incident light and the work function for metal surface (d) None of these

7. At stopping potential V_o, the current passing through circuit is:

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

8. The number of electrons emitted depends upon

(a) Color of target surface (b) Shape of the surface
(c) Frequency of incident light (d) Intensity of incident light

9. The unit of work function is:

(a) Volt (b) eV (c) Farad (d) Hertz

10. Application of photoelectric effect is

(a) Photo diode (b) Photo transistor (c) Photocell (d) None of these

11. Potassium cathode in photocell emits electrons for a light that is:

(a) X-rays (b) Infrared (c) Ultraviolet (d) Visible

12. Wave nature of light appears in:

(a) Pair production (b) Compton Effect (c) Photoelectric effect (d) Interference

MCQ # 1: (c)	**MCQ # 2: (b)**	**MCQ # 3: (a)**	**MCQ # 4: (b)**	**MCQ # 5: (d)**	**MCQ # 6: (c)**
MCQ # 7: (c)	**MCQ # 8: (d)**	**MCQ # 9: (b)**	**MCQ # 10: (a)**	**MCQ # 11: (d)**	**MCQ # 12: (d)**

MCQs Related to the Article "COMPTON EFFECT"

1. Compton's effect is associated with:

(a) Gamma Rays (b) X-rays (c) Beta Rays (d) Positive Rays

2. In Compton effect, the law/laws are conserved

(a) Energy (b) Momentum (c) Both (d) None of these

3. The change in wavelength of scattered photon in Compton's effect is:

(a) $\frac{m_o}{hc}(1-\cos\theta)$ (b) $\frac{h}{m_o c^2}(1-\cos\theta)$ (c) $\frac{h}{m_o c}(1+\cos\theta)$ (d) $\frac{h}{m_o c}(1-\cos\theta)$

4. The factor $\frac{h}{m_o c}$ in Compton equation has dimensions of:

(a) Pressure (b) Length (c) Mass (d) Momentum

5. Compton shift is equal to Compton's wavelength when the scattered X-ray photons are observed at an angle:

(a) 0° (b) 45° (c) 60° (d) 90°

6. Compton's shift in the wavelength $\Delta\lambda$ is zero, when scattered angle of photon is

(a) 0℃ (b) 90℃ (c) 180℃ (d) 45℃

7. A maximum Compton shift in the wavelength of scattered photon will be occur at

(a) $\theta = 0°$ (b) $\theta = 45°$ (c) $\theta = 90°$ (d) $\theta = 180°$

8. Compton's Effect proves:

(a) Wave nature of radiation (b) Wave nature of particle

(c) Dual nature of matter (d) Particle nature of radiation

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

MCQs Related to the Article "PAIR PRODUCTION"

1. Photon with energy greater than 1.02 MeV can interact with matter as

(a) Photoelectric effect (b) Compton effect (c) Pair production (d) Pair annihilation

2. The minimum energy needed for a photon to create an electron-positron pair is

(a) 1.02 KeV (b) 0.51 KeV (c) 0.51 MeV (d) 1.02 MeV

3. The rest mass energy of an electron in MeV is equal to

(a) 0.511 (b) 0.611 (c) 0.902 (d) 1.02

4. The anti-particle of electron is

(a) Proton (b) Position (c) Meson (d) Neutron

5. The energy of each positron is given by:

(a) 1.2 MeV (b) 1.02 MeV (c) 0.51 MeV (d) 5.1 MeV

6. The rest mass energy of and electron-positron pair is:

(a) 1.2 MeV (b) 1.02 MeV (c) 0.51 MeV (d) 5.1 MeV

7. Pair production is also called:

(a) Pair annihilation (b) Materialization of energy

(c) Fusion Reaction (d) Fission Reaction

8. The condition $hf > 2m_o c^2$ refers to:

(a) Compton effect (b) Pair Production

(c) Photoelectric effect (d) Annihilation of matter

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

MCQs Related to the Article "19.6 ANNIHILATION OF MATTER"

1. When an electron combines with a positron, we get

(a) One photon (b) Two photons (c) Three photons (d) Four photons

2. Electron is an antiparticle of

(a) Proton (b) Photon (c) Positron (d) Deuteron

3. A positron is a particle having

(a) Mass equal to electron (b) Charge equal to electron

(c) Equal mass but opposite charge to electron (d) Mass equal to proton

4. The reverse process of pair-production is

(a) Annihilation (b) Materialization (c) Fission (d) Fusion

5. Neutron was discovered in 1932 by

(a) Bohr (b) Chadwick (c) Dirac (d) Fermi

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

MCQs Related to the Article "19.7 WAVE NATURE OF PARTICLES"

1. Who gave the idea of matter wave?

(a) De-Broglie (b) Planck (c) Einstein (d) Huygen

2. Wavelength λ associated with the particle with the particle of mass m and moving with velocity v is:

(a) $\frac{mv}{h}$ (b) $\frac{hv}{m}$ (c) $\frac{h}{mv}$ (d) $\frac{m}{hv}$

3. Davisson and Germer indicates _____ in their experiment

(a) Electron refraction (b) Electron polarization
(c) Electron reflection (d) Electron diffraction

4. In Davison – Germer experiment, the diffracted electron from crystal shows _____

(a) Particle property (b) Wave property (c) Light property (d) Quantum property

5. In electron microscope, electric and magnetic field are used as _____

(a) Electromagnetic gun (b) Source of electromagnetic waves
(c) Deflected charged particle (d) Converging source of electrons

6. _____ has the largest de Broglie wavelength at same speed.

(a) Proton (b) α −particle (c) Neutron (d) Electron

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

MCQs Related to the Article "19.8 UNCERTAINTY PRINCIPLE"

The uncertainty in momentum and position is due to its _____

(a) Emotion of certain wave length (b) Two dimensional motions
(c) Property of matter and radiation (d) Very high velocity

MCQ # 1: (c)

CHAPTER # 20
ATOMIC SPECTRA

MCQs Related to the Article "20.1ATOMIC SPECTRA"

1. The radiations emitted from hydrogen filled discharge tube show _____
(a) Bound spectrum (b) Line spectrum
(c) Continuous spectrum (d) Absorption spectrum

2. A spectrum of radiation in which the quantity being studied, such as frequency or energy, takes discrete values is called:
(a) Continuous spectra (b) Band spectra
(c) Line spectra (d) None of these

3. Which of the following is an example of line spectra?
(a) Black body radiation spectra (b) Molecular spectra
(c) Atomic spectra (d) None of these

4. Sunlight spectrum is
(a) Discrete (b) Line spectrum (c) Continuous spectrum (d) None

5. Which is an example of continuous spectra?
(a) Black Body Radiation Spectrum (c) Molecular Spectra
(c) Atomic Spectra (d) None of these

6. Hydrogen atom spectrum does not lie in:
(a) Visible region (b) Ultraviolet region (c) Infrared region (d) X-ray region

7. The value of Rydberg's constant is:
(a) $1.0974 \times 10^{7}\ m^{-1}$ (b) $1.6 \times 10^{-19}\ C$ (c) 1.05×10^{-34} Js (d) $9.1 \times 10^{-34}\ kg$

8. The unit of Rydberg's constant R_H is:
(a) m^{-2} (b) m^{-1} (c) m (d) m^{2}

9. Which of the following series of H-spectrum lies in ultraviolet region:
(a) Pfund Series (b) Balmer Series (c) Paschen Series (d) Lyman Series

10. Lyman series contains the wavelength given by formula:
(a) $\frac{1}{\lambda} = E_o\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = E_o\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = E_o\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = E_o\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$

11. In the spectrum of which of the following, will you find Balmer Series:
(a) Oxygen (b) Nitrogen (c) Hydrogen (d) All a, b & c

12. Balmer series is obtained when all the transitions of electron terminate on:
(a) 2nd orbit (b) 3rd orbit (c) 4th orbit (d) 5th orbit

13. Balmer series in mathematical form can be expressed as:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$

14. Balmer empirical formula explains the electromagnetic radiation of any excited atom in terms of their:
(a) Energy (b) Mass (c) Wavelength (d) Momentum

15. Balmer series lies in
(a) Visible region (b) Ultraviolet region (c) Infrared region (d) X-ray region

16. First spectral series of hydrogen atom was discovered by:
(a) Balmer (b) Lyman (c) Paschen (d) Rydberg

17. Paschen series is obtained when all the transitions of electron terminate on:
(a) 2nd orbit (b) 3rd orbit (c) 4th orbit (d) 5th orbit

18. The relation for paschen series is given by:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

19. For paschen series, value of n starts from:
(a) 2 (b) 4 (c) 6 (d) 8

20. Brackett series can be expressed as:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

21. Bracket series is obtained when all transition of electron terminate on _____
(a) 4th orbit (b) 5th orbit (c) 3rd orbit (d) 2nd orbit

22. The shortest wavelength in Bracket series has wavelength:
(a) $\frac{16}{R_H}$ (b) $\frac{R_H}{16}$ (c) $16\ R_H$ (d) $4\ R_H$

23. The relation for pfund series is given by:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

24. The number of lines in the complete spectrum of hydrogen atom is:
(a) 1 (b) 2 (c) 4 (d) Infinite

25. Radiation with wavelength longer than red light_____
(a) Ultraviolet rays (b) X-rays (c) Infrared radiation (d) Visible radiations

MCQ # 1: (b)	MCQ # 2: (c)	MCQ # 3: (c)	MCQ # 4: (c)	MCQ # 5: (a)	MCQ # 6: (d)	MCQ # 7: (a)
MCQ # 8: (b)	MCQ # 9: (d)	MCQ # 10: (a)	MCQ # 11: (c)	MCQ # 12: (a)	MCQ # 13: (b)	MCQ # 14: (c)
MCQ # 15: (a)	MCQ # 16: (a)	MCQ # 17: (b)	MCQ # 18: (b)	MCQ # 19: (b)	MCQ # 20: (c)	MCQ # 21: (a)
MCQ # 22: (b)	MCQ # 23: (d)	MCQ # 24: (d)	MCQ # 25: (c)			

MCQs Related to the Article "20.2 BOHR'S MODEL TO HYDROGEN ATOM"

1. Bohr second postulate $\left(mvr = n\frac{h}{2\pi}\right)$ was justified by:

(a) Bohr (b) DeBroglie (c) Heisenberg (d) Davisson and Germer

2. If an electron jumps from nth orbit of energy E_n to pth (lower) orbit of energy E_p, a photon of frequency f and wavelength λ obeys the relation:

(a) $E_n - E_p = f\lambda$ (b) $E_n - E_p = hf$ (c) $E_n - E_p = h\lambda$ (d) $E_n - E_p = \frac{f\lambda}{h}$

3. According to Bohr's theory the outer orbit Electron has _____ energy than inner orbits.

(a) Greater (b) Smaller (c) Equal (d) None of these

4. When an electron absorbs energy, it jumps to:

(a) Lower energy state (b) Higher energy state
(c) Ground energy state (d) Remains in the same state

5. If one or more electrons are completely removed from an atom, then atom is said to be:

(a) Excited (b) Polarized (c) Stabilized (d) Ionized

6. The orbital angular momentum in the allowed stationary orbits of Hygdrogen atom is given by:

(a) $\frac{2\pi}{nh}$ (b) $\frac{nh}{2\pi}$ (c) $\frac{2h}{n\pi}$ (d) $\frac{h}{\pi}$

7. The relation between Rydberg's constant R_H and ground state energy E_o is:

(a) $R_H = \frac{E_o}{hc}$ (b) $R_H = \frac{hc}{E_o}$ (c) $E_o = \frac{R_H}{hc}$ (d) $E_o = \frac{hc}{R_H}$

8. Bohr's theory is failed to explain

(a) H – spectrum (b) He – spectrum (c) Complex atoms spectrum

9. The potential required to remove an electron from atom is called:

(a) Critical Potential (b) Excitation Potential
(c) Absolute Potential (d) Ionization Potential

10. The quantized energy of first Bohr orbit of hydrogen atom is

(a) 13.04 eV (b) 3.7 eV (c) 13 eV (d) 13.6 eV

11. The quantized radius of first Bohr orbit of a hydrogen atom is:

(a) 0.053 nm (b) 0.0053 nm (c) 0.00053 nm (d) 0.53 nm

12. The radius of 3rd Bohr orbit in H-atom is greater than the radius of 1st orbit by the factor

(a) 2 (b) 3 (c) 4 (d) 9

13. The speed of electrons in nth orbit is given as:

(a) $\frac{4\pi^2 ke^2}{nh}$ (b) $\frac{2\pi ke^2}{nh}$ (c) $\frac{2\pi ke}{n^2h^2}$ (d) $\frac{2\pi^2 ke^2}{nh}$

14. Speed of electron in first Bohr's orbit is:

(a) $2.19 \times 10^{-6}\ m/s$ (b) $2.19 \times 10^{6}\ m/s$ (c) $2.19 \times 10^{-6}\ cm/s$ (d) $2.19 \times 10^{6}\ cm/s$

15. The total energy of electron in the state $n = \infty$ of hydrogen atom is:

(a) Zero (b) 3.2 eV (c) 10.2 eV (d) 13.6 eV

16. The total energy of electron in an orbit around the nucleus is

(a) + ive (b) – ive (c) zero (d) None

17. The value of Plank's constant is

(a) 6.63×10^{-34} J.sec (b) 6.63×10^{-34} J/sec (c) 6.63×10^{-34} sec/J (d) None of these

18. Ratio of the weight of H-atom to that of an electron is approximately _____

(a) 183.336 (b) 1836 (c) 18360.00 (d) 183.60

19. Ground state energy of the 4th orbit in a H-atom is _____

(a) 13.60eV (b) 3.40eV (c) 0.85eV (d) 1.51eV

20. If the ionization energy of hydrogen atom is 13.6 eV, its ionization potential will be _____

(a) 13.6 V (b) 136.0 V (c) 3.4 V (d) 0 V

21. Photon of high frequency will be absorbed when transition takes place from _____

(a) 1st to 5th orbit (b) 2nd to 5th orbit (c) 3rd to 5th orbit (d) 4th to 5th orbit

MCQ # 1: (b)	MCQ # 2: (b)	MCQ # 3: (a)	MCQ # 4: (b)	MCQ # 5: (d)	MCQ # 6: (b)	MCQ # 7: (a)
MCQ # 8: (c)	MCQ # 9: (d)	MCQ # 10: (d)	MCQ # 11: (a)	MCQ # 12: (d)	MCQ # 13: (b)	MCQ # 14: (b)
MCQ # 15: (d)	MCQ # 16: (b)	MCQ # 17: (a)	MCQ # 18: (b)	MCQ # 19: (c)	MCQ # 20: (a)	MCQ # 21: (a)

MCQs Related to the Article "20.3 INNER SHELL TRANSITIONS AND CHARACTERISTIC X-RAYS"

1. The reverse process of photo-electric effect is:

(a) Compton Effect (b) X-ray production (c) Pair Production (d) Pair Annihilation

2. When magnetic field is applied in the path X –rays , they will be moving in

(a) Straight line (b) Circular path (c) Parabolic path (d) None

3. X – rays is also known as

(a) Photon (b) γ – rays (c) Breaking radiation

4. X - rays are similar in nature to _____

(a) Cathode rays (b) Positive rays (c) γ - rays (d) α - rays

5. Quality of X-rays depends upon _____

(a) Filament current (b) Accelerating voltage (c) Material of the target (d) b and c

6. In an X - ray tube, electrons each of charge e are accelerated through V potential difference allowed to hit a metal target, the wavelength of the X-rays emitted is ___

(a) hc/eV (b) he/Vc (c) eV/h (d) impossible to predict

7. Emission of electrons by metal on heating is called

(a) Secondary emission (b) Field effect
(c) Photoelectric emission (d) Thermionic emission

8. In electronic transition, an atom cannot emit:

(a) γ −rays (b) Infrared rays (c) UV rays (d) X −rays

9. Photons emitted in inner shell transition are:

(a) Continuous X-rays (b) Discontinuous X-rays
(c) Characteristic X-rays (d) Energetic X-rays

10. X-rays are _____

(a) Unknown nature (b) High energy electrons
(c) High energy photon (d) Radioisotopes

11. Characteristic X – rays are the X – rays which have

(a) High energy photons (b) Specific wavelengths
(c) Specific frequencies (d) All of these

12. X-ray photons moves with a speed of :

(a) Light (b) sound
(c) Less than speed of light (d) Greater than speed of light

13. X–rays can cause cancer in living cells due to radiation exposure which is

(a) Small (b) Large (c) Excessive (d) None of these

MCQ # 1: (b)	**MCQ # 2: (a)**	**MCQ # 3: (c)**	**MCQ # 4: (c)**	**MCQ # 5: (d)**	**MCQ # 6: (a)**	**MCQ # 7: (d)**
MCQ # 8: (a)	**MCQ # 9: (c)**	**MCQ # 10: (c)**	**MCQ # 11: (d)**	**MCQ # 12: (a)**	**MCQ # 13: (c)**	

MCQs Related to the Article "20.4 UNCERTAINTY WITHIN THE ATOM"

1. According to Heisenberg's uncertainty principle, the quantities which cannot be measured simultaneously with accuracy are:

(a) Energy and Momentum (b) Position and Momentum
(c) Position and Energy (d) Momentum and Time

2. Which is the more careful calculation by Warner Heisenberg:

(a) $\Delta E.\Delta t \approx \hbar$ (b) $\Delta x.\Delta p \approx \hbar$ (c) $\Delta x.\Delta p \geq \hbar$ (d) $\Delta m.\Delta v \approx \hbar$

MCQ # 1: (b)	**MCQ # 2: (c)**

MCQs Related to the Article "20.5 LASER"

1. Laser is a device which can produce

(a) An intense beam of light (b) Coherent light
(c) Monochromatic light (d) All a, b & c

2. Which one of the following is more coherent

(a) X – rays (b) Normal light (c) Laser (d) γ – rays

3. Which is not a characteristics of a LASER:

(a) Monochromatic (b) Coherent (c) Intense (d) Multi-Directional

4. LASER action can be produced if an atom is in its:

(a) Normal State (b) Excited State (c) Ionized State (d) De-Excited State

5. The velocity of laser light is _____

(a) Less than ordinary light (b) More than ordinary light
(c) Equal to ordinary light (d) Different for different colors or frequency

6. In laser production, the state in which more atoms are in the upper state then in the lower one is called _____

(a) Metal stable state (b) Normal state
(c) Population Inversion (d) All the above

7. In population inversion:

(a) All electrons are in excited state (b) Some electrons are in excited state
(c) Majority of electrons are in excited state (d) None of these

8. In Laser a Meta-stable state is

(a) An excite state (b) In which an electron is usually stable
(c) In which an electron reside 10^{-3} sec (d) All a, b & c

9. Excited atoms return to their ground state in _____

(a) 10^{-10}s (b) 10^{-8}s (c) 10^{-6}s (d) 10^{-9}s

10. The residing time of atoms in metastable state is:

(a) $10^{-6}s$ (b) $10^{-5}s$ (c) $10^{-4}s$ (d) $10^{-3}s$

11. The Meta-stable state of Helium and Neon is

(a) Different (b) Identical (c) Nearly identical (d) None of these

12. In He-Ne LASER, the discharged tube is filled with:

(a) 80% He & 20% Ne (b) 83% He & 17% Ne (c) 85% He & 15% Ne (d) 90% He & 10% Ne

13. Helium-Neon Laser beam emitted from a discharge tube has a color:
(a) Blue (b) Green (c) Red (d) White
14. Optical pumping exist in
(a) X – rays (b) Laser (c) Spectrum (d) None
15. Reflecting mirrors in laser is used to _____
(a) Further stimulation (b) Lasing more
(c) For production more energetic laser (d) All the above
16. A finally focused beam of LASER used to destroy:
(a) Cancerous cells (b) Precancerous cells (c) Living cells (d) Both a and b
17. Laser beam can be used to generate
(a) One dimensional images (b) Two dimensional images
(c) Three dimensional images (d) None of these
18. Laser beam can be used for
(a) Wilding of detached retinas (b) Destroy tissues in a localized area
(c) Sealed off capillaries for prevention of disease (d) All of them

MCQ # 1: (d)	**MCQ # 2: (c)**	**MCQ # 3: (d)**	**MCQ # 4: (b)**	**MCQ # 5: (c)**	**MCQ # 6: (c)**	**MCQ # 7: (c)**
MCQ # 8: (d)	**MCQ # 9: (b)**	**MCQ # 10: (d)**	**MCQ # 11: (c)**	**MCQ # 12: (c)**	**MCQ # 13: (c)**	**MCQ # 14: (b)**
MCQ # 15: (d)	**MCQ # 16: (d)**	**MCQ # 17: (c)**	**MCQ # 18: (d)**			

Chapter # 21
NUCLEAR PHYSICS

MCQs Related to the Article "21.1 ATOMIC NUCLEAUS"

1. Neutron and proton are commonly known as _____

(a) Nucleons (b) Meson (c) Boson (d) Quartz

2. The mass of proton is equal to:

(a) $1.675 \times 10^{-19}\ kg$ (b) $1.673 \times 10^{-27}\ kg$ (c) $9.1 \times 10^{-31}\ kg$ (d) None of these

3. One unified mass scale (1 μ) is equal to:

(a) $1.6606 \times 10^{-27}\ kg$ (b) $1.7606 \times 10^{-27}\ kg$
(c) $1.8606 \times 10^{-27}\ kg$ (d) None of these

4. The number of neutrons in $^{238}_{92}U$ is:

(a) 92 (b) 238 (c) 146 (d) 330

5. The numbers of protons in an atom are always equal to the number of:

(a) Neutrons (b) Electrons (c) Positrons (d) Mesons

6. Charge on neutron is _____

(a) $1.6 \times 10^{-19}\ C$ (b) $-1.6 \times 10^{-19}\ C$ (c) No definite charge (d) Zero

7. Mass of neutron is _____

(a) $1.67 \times 10^{-13}\ kg$ (b) $1.67 \times 10^{-27}\ kg$ (c) $9.1 \times 10^{-31}\ kg$ (d) $1.67 \times 10^{-19}\ kg$

8. The number of protons in any atom are always equal to the number of:

(a) Electrons (b) Neutrons (c) Positrons (d) Mesons

9. According to which one of following law, the density of nucleus is uniform ?

(a) J.J. Thomson (b) Rutherford's Model
(c) Bohr's Model (d) All of above laws

10. The number of neutrons in $^{7}_{3}Li$ is:

(a) 3 (b) 7 (c) 4 (d) 2

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

MCQs Related to the Article "21.2 ISOTOPES"

1. Nuclei having the same mass number but different atomic number are _____

(a) Isomers (b) Isobars (c) Isotones (d) Isotopes

2. Hydrogen is also called:

(a) Deutrium (b) Tritium (c) Protium (d) All of these

3. A mass spectrograph sorts out _____

(a) Molecules (b) Ions (c) Elements (d) Isotopes

4. Both xenon and cesium each have

(a) 24 isotopes (b) 28 isotopes (c) 32 isotopes (d) 36 isotopes

5. Number of isotopes of Neon gas are:

(a) 2 (b) 3 (c) 4 (d) 1

6. The chemical properties of any element depend on its:

(a) Number of isotopes (b) Number of isobars
(c) Atomic number (d) Mass number

7. Number of isotopes of Helium is:

(a) 2 (b) 3 (c) 4 (d) 5

8. Nuclei having the same mass number but different atomic number are _____

(a) Isotopes (b) Isobars (c) Isotones (d) Isomers

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

MCQs Related to the Article "21.3 MASS DEFECT AND BINDING ENERGY"

1. Sum of the masses of constituent nucleons as compared to the mass of the resultant nucleus is _____

(a) Smaller (b) Greater (c) Same (d) Can't Predict

2. The binding energy per nucleon for iron is:

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

3. Binding energy for deuteron nucleus is given by:

(a) 2.8 MeV (b) 2.23 MeV (c) 2.28 MeV (d) 2.25 MeV

4. The value of 1 μ mass = _____

(a) 931 MeV (b) 932 MeV (c) 933 MeV (d) 934 MeV

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

MCQs Related to the Article "21.4 RADIOACTIVITY"

1. Which one of the following is similar to electrons:

(a) α −particles (b) β −particles (c) γ −particles (d) Neutrino

2. Which one is better shield against γ −rays:

(a) Wood (b) Lead (c) Aluminum (d) Water

3. When a β-particle is emitted out of any nucleus, then its mass number is:

(a) Increased (b) Remain same (c) Decrease (d) Infinity

4. γ −Emission from the nucleus of an atom causes:

(a) Change in Z (b) Change in A (c) Change in both A & Z (d) No change in A & Z

5. Marie Curie and Pierre Curie discovered two new radioactive elements which are:

(a) Uranium & Radium (b) Platinum and Radium
(c) Polonium and Radium (d) Crypton and Radium

6. Which of the following have no charge:

(a) α – rays (b) β - rays (c) γ - rays (d) Cathode rays

7. The charge on an alpha particle is:

(a) $+2e$ (b) $-2e$ (c) $+e$ (d) $-2e$

8. When alpha particle is emitted out of any nucleus, then due to law of conservation of matter, the mass number of the nucleus is decreases by:

(a) 1 (b) 2 (c) 3 (d) 4

9. The element formed by radioactive decay is called:

(a) Father element (b) Mother element (c) Parent element (d) Daughter element

10. Which of the following equation represents β −decay?

(a) ${}^{A}_{Z}X \rightarrow {}^{A}_{Z+1}Y + {}^{0}_{-1}e$ (b) ${}^{A}_{Z}X \rightarrow {}^{A-1}_{Z}Y + {}^{0}_{-1}e$
(c) ${}^{A}_{Z}X \rightarrow {}^{A+1}_{Z+1}Y + {}^{0}_{-1}e$ (d) ${}^{A}_{Z}X \quad {}^{A-1}_{Z+1}Y + {}^{0}_{-1}e$

11. By emitting β −particle and γ −particle simultaneously, the nucleus changes its charge by:

(a) Losses by 1 (b) Increases by 1 (c) Increases by 2 (d) Remain same

12. Radioactivity happens due to disintegration of:

(a) Nucleus (b) Mass (c) Electrons (d) Protons

13. An α −particle contains:

(a) 1 proton & 1 neutron (b) 1 proton & 2 neutron
(c) 2 proton & 1 neutron (d) 2 proton & 2 neutron

MCQ # 1: (b)	MCQ # 2: (b)	MCQ # 3: (b)	MCQ # 4: (d)	MCQ # 5: (c)	MCQ # 6: (c)	MCQ # 7: (a)	MCQ # 8: (d)
MCQ # 9: (d)	MCQ # 10: (a)	MCQ # 11: (b)	MCQ # 12: (a)	MCQ # 13: (d)			

MCQs Related to the Article "21.5 HALF LIFE"

1. The rate of decay of a radioactive substance:

(a) Remains constant with time (b) Increases with time
(c) Decreases with time (d) May increase or decrease with time

2. Half-life of the iodine-131 is 8 days and its weight is 20 mg. After 4 half-lives, the amount left undecayed will be:

(a) 2.5 mg (b) 1.25 mg (c) 0.625 mg (d) 0.3112 mg

3. The reciprocal of decay constant (λ) of a radioactive element is:

(a) Half-life (b) Mean Life (c) Total life (d) Curie

4. The half-life of radon gas is:

(a) 1620 years (b) 4.5×10^{9} years (c) 3.8 days (d) 23.5 minutes

5. The half-life of uranium-238 is:

(a) 1620 years (b) 4.5×10^{9} years (c) 3.8 days (d) 23.5 minutes

6. Half-life of Radium is 1590 years. In how many years shall the earth loss all his radium due to radioactive decay?

(a) 1590×10^{6} years (b) 1590×10^{12} years
(c) 1590×10^{24} years (d) Never

7. The unit of decay constant λ is:

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

8. A sample contains N radioactive nuclei. After 4 half-lives, number to nuclei decayed will be:

(a) $\frac{N}{16}$ (b) $\frac{15N}{16}$ (c) $\frac{N}{8}$ (d) $\frac{7N}{8}$

9. The half-life of a radioactive element depends upon:

(a) Pressure (b) Temperature (c) Amount of Substance (d) No external influence

10. After two half-lives, the number of undecayed nuclei of an element are:

(a) N (b) $\frac{N}{2}$ (c) $\frac{N}{4}$ (d) $\frac{3N}{4}$

11. Radioactive materials can be identified by measuring their_____

(a) Hardness (b) Density (c) Mass (d) Half life

12. If a radioactive isotope of silver have a half-life of about 7.5 days. After 15 days the remaining isotope of its original is

(a) 25% (b) 50% (c) 7.5% (d) 15%

13. The relation between the decay constant λ and half life $T_{1/2}$ is given by:

(a) $T_{1/2} = \frac{0.693}{\lambda}$ (b) $T_{1/2} = 1.43\ \lambda$ (c) $T_{1/2} = 0.693\lambda$ (d) $T_{1/2} = \frac{1.43}{\lambda}$

14. Radioactive decay obeys which one of the following data?

(a) $N = N_o e^{-\lambda t}$ (b) $N = N_o e^{\lambda t}$ (c) $N = N_o e^{-\frac{\lambda t}{2}}$ (d) $N_o = N e^{-\lambda t}$

15. Hal- life of radium-226 is:

(a) 1820 years (b) 1920 years (c) 1620 years (d) 1680 years

MCQ # 1: (c)	MCQ # 2: (b)	MCQ # 3: (b)	MCQ # 4: (c)	MCQ # 5: (b)	MCQ # 6: (d)	MCQ # 7: (c)	MCQ # 8: (b)
MCQ # 9: (d)	MCQ # 10: (c)	MCQ # 11: (d)	MCQ # 12: (a)	MCQ # 13: (a)	MCQ # 14: (a)	MCQ # 15: (c)	

MCQs Related to the Article "21.6 INTERACTION OF RADIATION WITH MATTER"

1. The mass of beta particles is equal to the mass of

(a) Protons (b) Electrons (c) Neutrons (d) Boron

2. Which particle has large range in air:

(a) α −particles (b) β −particles (c) γ −rays (d) Neutrons

3. Speed of β −particles is nearly equal to:

(a) $1 \times 10^8\ m\ s^{-1}$ (b) $1 \times 10^7\ m\ s^{-1}$ (c) $3 \times 10^8\ m\ s^{-1}$ (d) $1 \times 10^6\ m\ s^{-1}$

4. The charge on β −particle is:

(a) $+e$ (b) $-e$ (c) $+2e$ (d) $-2e$

5. γ −rays emitted from radioactive element have speed:

(a) $1 \times 10^{18}\ m\ s^{-1}$ (b) $1 \times 10^7\ m\ s^{-1}$ (c) $3 \times 10^8\ m\ s^{-1}$ (d) $4 \times 10^{19}\ m\ s^{-1}$

6. Cobalt—60 is the source for:

(a) α −particles (b) β −particles (c) γ −rays (d) Neutrons

7. How many times, the α −particle is more massive than electrons?

(a) 6332 (b) 7332 (c) 8332 (d) 9332

8. Which one of the following radiation possesses maximum penetrating power?

(a) α – rays (b) β - rays (c) γ - rays (d) All have equal penetrating power

9. Which one of the following possesses maximum velocity?

(a) α - rays (b) β - rays (c) γ - rays (d) All of the above have same speed

10. During an encounter with an atom α - particle knocks out _____

(a) Protons (b) Electrons (c) Neutrons (d) Nothing

11. β -particle ionizes an atom _____

(a) Through direct collision (b) Through electrostatic attraction
(c) Through electrostatic repulsion (d) All of above

12. The penetration power of β - particle as compared to α -particle is_____

(a) 10 times more (b) 100 times more (c) 100 times less (d) 10 times less

13. A α - particle can produce fluorescence in _____

(a) ZnS (b) Barium Palatino cyanide
(c) Calcium tunzstate (d) All of above

14. Average distance covered by α - particle in air before its ionizing power ceases is called its _____

(a) Trajectory (b) Range (c) Firing level (d) Limit

15. β -particles possess greater penetration power then that of a-particle due to its _____

(a) Smaller ionization power (b) Energy is not conserved
(c) Neither greater nor smaller ionization power (d) Same ionization power

16. Pair production can take places only with _____
(a) X-rays (b) γ - rays (c) UV-rays (d) IR-rays
17. The α - particle ionizes the particles in its way and adopt the path which is
(a) Curved (b) Straight (c) Zig–Zag (d) None of these
18. Neutron interact with materials containing hydrogen atoms and knock out
(a) Electron (b) Proton (c) Photon (d) None of these
19. Neutron produce ionization by knocking out proton which is
(a) Direct ionization (b) Indirect ionization (c) Both (d) None of these
20. γ - rays are absorbed by a sheet of
(a) 1-5 mm of lead (b) 1-10 cm of lead (c) 5 -10 mm of lead (d) None of these
21. Ultraviolet radiation cause
(a) Sum burn (b) Blindness (c) Skin Cancer (d) All of them
22. Neutrons are particularly more damaging to
(a) Legs (b) Heart (c) Eyes (d) Brain
23. Electron is an antiparticle of:
(a) Proton (b) Photon (c) Positron (d) Deutron
24. Which of the following has no charge?
(a) Alpha rays (b) Beta rays (c) Gamma rays (d) Cathode rays

MCQ # 1: (b)	MCQ # 2: (c)	MCQ # 3: (a)	MCQ # 4: (b)	MCQ # 5: (c)	MCQ # 6: (c)	MCQ # 7: (b)	MCQ # 8: (c)
MCQ # 9: (c)	MCQ # 10: (b)	MCQ # 11: (c)	MCQ # 12: (b)	MCQ # 13: (d)	MCQ # 14: (b)	MCQ # 15: (a)	MCQ # 16: (b)
MCQ # 17: (b)	MCQ # 18: (b)	MCQ # 19: (b)	MCQ # 20: (b)	MCQ # 21: (d)	MCQ # 22: (c)	MCQ # 23: (c)	MCQ # 24: (c)

MCQs Related to the Article "21.7 RADIATION DETECTORS"

1. A detector that can count fast and operate at low voltage is:
(a) G M counter (b) Solid State Detector (c) Wilson Cloud Chamber
2. In Wilson cloud chamber, we use:
(a) Alcohol vapours (b) Neon gas (c) Bromine gas (d) Water vapours
3. The α −particles have tracks
(a) Thick (b) Straight (c) Continuous (d) All a, b & c
4. The β −particles have tracks
(a) Thin (b) Discontinuous (c) Continuous (d) Both a & b
5. The γ −rays have
(a) Thick tracks (b) Thin tracks (c) No definite tracks (d) Continuous tracks
6. β – particles in Wilson cloud chamber have:
(a) zigzag or erratic path (b) Curved path
(c) Circular Path (d) Elliptical path
7. A high potential difference of _____ is used in G.M. counter.
(a) 400 V (b) 1000 V (c) 5000 V (d) 4000 V
8. Geiger counter is suitable for _____
(a) Fast counting (b) Extremely fast counting
(c) Slow counting (d) All situations
9. A device for producing high velocity nuclei is _____
(a) Cloud chamber (b) Linear acceleration
(c) A mass spectrograph (d) Wilson cloud
10. The quenching of gas by a quenching gas is called
(a) Quenching (b) Self quenching (c) Forced quenching (d) None of these
11. The dead time of Geiger Muller counter is of the order of
(a) Micro second (b) Milli second (c) More than millisecond (d) None of these
12. A device which shows the visible path of ionizing particle is called:
(a) GM counter (b) Solid Detector (c) Scaler (d) Wilson Cloud Chamber

MCQ # 1: (b)	MCQ # 2: (a)	MCQ # 3: (d)	MCQ # 4: (d)	MCQ # 5: (c)	MCQ # 6: (a)	MCQ # 7: (a)	MCQ # 8: (c)
MCQ # 9: (b)	MCQ # 10: (b)	MCQ # 11: (c)	MCQ # 12: (d)				

MCQs Related to the Article "21.8 NUCLEAR REACTIONS"

1. When Nitrogen is bombard by alpha particles, nitrogen nucleus changes into:
(a) Oxygen (b) Carbon (c) Berium (d) Helium
2. Complete the reaction ${}_{Z}X^{A} \rightarrow \underset{Z+1}{X} + {}_{-}\beta^{\circ} + \ldots\ldots + Q$
(a) Neutrino (b) Antineutrino (c) α - particle (d) None

3. A nuclide $_{86}R^{220}$ decays to a new nuclide by two α -emissions, the nuclide S is

(a) $_{84}S^{212}$ (b) $_{82}S^{212}$ (c) $_{80}S^{220}$ (d) None

4. An α - particle is emitted from $_{88}Ra^{226}$, what is the mass and atomic number of the daughter nucleus?

(a) $A = 224$ & $Z = 84$ (b) $A = 220$ & $Z = 80$ (c) $A = 222$ & $Z = 86$ (d) $A = 226$ & $Z = 87$

5. Neutron was discovered by:

(a) Rutherford (b) Chadwick (c) Becquerel (d) Curie

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

MCQs Related to the Article "21.9 NUCLEAR FISSION"

1. The quantity of $^{235}_{92}U$ in naturally occuring urinium is:

(a) 0.1 % (b) 0.2 % (c) 0.3 % (d) 0.7 %

2. In fast reactor, $^{238}_{92}U$ nuleus abasorbs fast neutrons and is ultimately transformed into _____by emitting β −radiation:

(a) $^{235}_{92}U$ (b) $^{239}_{94}Pu$ (c) $^{208}_{82}Pb$ (d) $^{232}_{90}Th$

3. Nuclear fission chain reaction is controlled by using:

(a) Steel rod (b) Graphite rods (c) Cadmium rod Patinum rods

4. For chain reaction to buildup, the size of the radioactive target should be _____

(a) Greater than the critical size (b) Less than the critical size (c) Equal to critical size

5. Energy liberated when one atom of U-235 undergoes fission reaction is _____

(a) 200 MeV (b) 40 MeV (c) 30 MeV (d) 20 MeV

6. Tick the correct statement

(a) Moderator slow down the neutron (b) Moderator bring the neutrons to rest
(c) Moderator absorb the neutron (d) Moderator reflect the neutron

7. Fission nuclear reaction leads to a _____ stability.

(a) Lesser (b) Greater (c) Medium (d) None

8. Plutonium can be fissioned by

(a) Slow neutron (b) Fast neutron (c) Very slow neutron (d) None of these

9. In liquid metal fast breeder reactor, the type of uranium used is _____

(a) $_{92}U^{235}$ (b) $_{92}U^{238}$ (c) $_{92}U^{234}$ (d) $_{92}U^{239}$

10. If one or more of the neutrons emitted during fission can be used to build up further fission then the reaction is self-sustained and is known as _____

(a) Fission reaction (b) Fusion reaction (c) Chain reaction (d) Chemical reaction

11. The breakage of $^{235}_{92}U$ produces the fragments as

(a) Kr and Ba (b) Sn and Mo (c) Xe and Sr (d) All of them

12. The fuel / fuels used in the reactor are nowadays

(a) Plutonium – 239 (b) Uranium – 233 (c) Uranium – 235 (d) All of these

13. In nuclear reactor, Urinium is enriched upto:

(a) 1% to 2 % (b) 1% to 3 % (c) 2% to 3 % (d) 2% to 4 %

MCQ # 1: (d)	MCQ # 2: (b)	MCQ # 3: (c)	MCQ # 4: (a)	MCQ # 5: (a)	MCQ # 6: (a)	MCQ # 7: (b)	MCQ # 8: (b)
MCQ # 9: (b)	MCQ # 10: (c)	MCQ # 11: (d)	MCQ # 12: (d)	MCQ # 13: (d)			

MCQs Related to the Article "21.10 FUSION REACTION"

1. The energy emitted from sun is due to:

(a) Fission reaction (b) Fusion reaction (c) Chemical reaction (d) Pair production

2. The energy released by fusion of two deuterons into a Helium nucleus is about:

(a) 24 MeV (b) 200 MeV (c) 1.02 MeV (d) 7.7 MeV

3. The nuclear reaction taking place in sun is:

(a) Fission (b) Fusion (c) Chain (d) Alpha decay

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

MCQs Related to the Article "21.11 RADIATION EXPOSURE"

1. The cosmic radiations consist of:

(a) High energy particles (b) Electromagnetic radiation
(c) Low energy charged particles (d) Both a & b

2. Antimatter consists of _____

(a) Antiproton (b) Antineutron (c) Positron (d) All of above

3. A particle having the mass of an electron and the charge of a proton is called

(a) Antiproton (b) Positron (c) Gamma rays (d) Photon

4. Color television (while operating) emits:

(a) α −rays (b) β −rays (c) γ −rays (d) X −rays

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

MCQs Related to the Article "21.12BIOLOGICAL EFFECTS OF RADIATION"

1. The SI unit for radioactivity is called

(a) Curie (b) Becquerel (c) Bel (d) None of these

2. One joule of energy absorbed in a body per kilogram is equal to:

(a) One rad (b) One rem (c) One gray (d) One sievert

3. One curie is equal to:

(a) $3.70 \times 10^{-10}\ Bq$ (b) $3.70 \times 10^{10}\ Bq$ (c) $1\ Bq$ (d) $10^{3}\ Bq$

4. One gray (G_y) is equal to

(a) $1\ J^{-1}kg^{-1}$ (b) $1\ J^{-1}kg^{-2}$ (c) $1J\ kg^{-2}$ (d) $1J\ kg^{-1}$

5. The average of background radiation to which we are exposed per year:

(a) 2 mSv (b) 1 mSv (c) 3 mSv (d) 0.01 Sv

6. Absorbed dose D is defined as:

(a) m/E (b) E/C (c) C/m (d) E/m

7. SI unit of absorbed dose is:

(a) Gray (b) Roentgen (c) Curie (d) Rem

8. The maximum safe limit weekly dose for persons working in a nuclear reactor is:

1 mSv (b) 2 mSv (c) 3 mSv (d) 4 mSv

9. The old and new units of absorbed dose are related by:

(a) 1 Gy=10 rad (b) 1 Gy=100 rad (c) 1 Gy=1000 rad (d) 1 Gy=10000 rad

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

MCQs Related to the Article "21.13 BIOLOGICAL AND MEDICAL USES OF RADIATION"

1. The mose useful tracer isotope for the treatment of thyroid gland is:

(a) Cobalt-60 (b) Carbon-14 (c) Iodine-131 (d) Strontium-90

2. Circulation of blood can be studied by:

(a) Sodium—24 (b) strontium—90 (c) Carbon—14 (d) Iodine—131

properties

3. Strontium -90 is used as _____

(a) β - particle source (b) α - particle source (c) γ - particle source (d) Neutrons source

4. Radiations are used for the treatment of skin of a patient is _____

(a) α - rays (b) β – rays (c) X - rays (d) γ – rays

5. The most useful tracer isotope in agriculture is:

(a) Cobalt 60 (b) Strontium – 90 (c) Carbon 14 (d) Nickel – 63

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

MCQs Related to the Article "21.14 BASIC FORCES OF NATURE"

1. Dr. Abdus Salam unified electromagnetic force and _____

(a) Weal Nuclear Force (b) Strong Nuclear Force

(c) Magnetic Force (d) Gravitational Force

2. Strong nuclear force

(a) Increase with magnitude of increasing charge (b) Decreases with magnitude of increasing charge

(c) Is independent of charge (d) None

3. Nuclear force exist between

(a) Proton – proton (b) Proton – Neutron (c) Neutron–Neutron (d) All of the above

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

MCQs Related to the Article "21.15 BUILDING BLOCKS OF MATTER"

1. Which of the following are elementary particles:

(a) Protons (b) Neutrons (c) Photons (d) Mesons

2. A particle is made up of two up quarks and one down quark is:

(a) Proton (b) Neutron (c) Boson (d) Lepton

3. Types of quarks are:

(a) 4 (b) 6 (c) 8 (d) 10

4. Sub atomic particles are divided into

(a) Photon (b) Leptons (c) Hadrons (d) All a, b & c

5. The building block of protons and neutrons are called

(a) Ions (b) Electrons (c) Positrons (d) Quarks

6. The particles equal in mass or greater than protons are called:

(a) Baryons (b) Hadrons (c) Fermions (d) Mesons

7. Electrons are:

(a) Hadrons (b) Leptons (c) Quarks (d) Baryons

8. Which of the following belong to "hadrons" group:

(a) Proton (b) Electron (c) Muons (d) Neutrinos

9. Two down and one up quark make:

(a) Proton (b) High energy photon (c) Positrons (d) Neutron

10. Which of the following is not hadron:

(a) Muons (b) Protons (c) Neutrons (d) Mesons

11. Hadrons are the particle included

(a) Protons (b) Neutrons (c) Mesons (d) All of these

12. Lepton's particles which experience no strong nuclear force are

(a) Electrons (b) Muons (c) Neutrinos (d) All of these

13. The charges on the quarks are

(a) One unit (b) Half unit (c) Fraction (d) None of these

14. Meson is made from

(a) A pair of quarks (b) A pair of anti quarks (c) A pair of quarks and anti quarks

15. Three up quarks combine to form a new particle, the charge on this particle is:

(a) 1 e (b) 2 e (c) 3 e (d) 4 e

MCQ # 1: (c) MCQ # 2: (a) MCQ # 3: (b) MCQ # 4: (d) MCQ # 5: (d) MCQ # 6: (a) MCQ # 7: (b) MCQ # 8: (a)
MCQ # 9: (d) MCQ # 10: (a) MCQ # 11: (d) MCQ # 12: (d) MCQ # 13: (c) MCQ # 14: (c) MCQ # 15: (b)