8. MAGNETISM AND MATTER

1. WHAT HAPPENS TO COMPASS MEEDLES AT THE EARTHS POLES

   A.It will align in any direction

2. WHAT DO YOU UNDERSTAND BY MAGNETIZATION OF A SAMPLE

   A. Net magnetic moment per unit volume

3. WHAT IS THE MAGNETIC MOMENT ASSOCIATED WITH A SOLENOID

   A. M=NIA

4. WHAT ARE THE UNITS OF MAGNETIC MOMENT, MAGNETIC INDUCTION AND MAGNETIC FIELD

   A. Magnetic moment = Am^2

   Magnetic induction = Tesla

   Magnetic field = Tesla

5. MAGNETIC LINES FORM CONTINUOUS CLOSED LOOPS. WHY

   A. North and south poles always exists in pairs

6. DEFINE MAGNETIC DECLINATION

   A. The angle between geographic meridian and magnetic meridian

7. DEFINE MAGNETIC INCLINATION OR ANGLE OF DIP

   The angle made by earths magnetic field with its horizontal component

8. CLASSIFY THE FOLLOWING MATERIAL WITH REGARD TO MAGNETISM

   MANGENESE, COBALT,NICKEL,BISMUTH,OXYGEN,COPPER

   A. Manganese , oxygen – paramagnetic

   Bismuth, copper – diamagnetic

   Nickel, cobalt – ferromagnetic

9. A MAGNETIC DIPOLE PLACED IN MAGNEITC FIELD EXPERIENCE AT NET FORCE WHAT CAN YOU SAY ABOUT THE NATURE OF MAGNETIC FIELD.

   A. The field is non uniform and experience both rotatory and translatory motion.

10. ALTERNATING CURRENT

1. WHAT TYPE OF TRANSFORMER IS USED IN A 6 V BED LAMP
   A. Step down transformer
2. WHAT IS THE PHENOMENON INVOLVED IN THE WORKING OF A TRANSFORMER
   A. Mutual inductance
3. WRITE THE EXPRESSION FOR THE REACTANCE OF AN INDUCTOR AND A CAPACITOR
   A. Reactance of an inductor = wL
   Reactance of a capacitor = 1/ wC
4. WHAT IS THE PHASE DIFFERENCE BETWEEN AC AEMF AND CURRENT IN THE FOLLOWING- PURE RESISTOR, PURE INDUCTOR AND PURE CAPACITOR
   A. Pure resistor = Inphase
   Pure inductor = π/2(current lags)
   Pure capacitor = π/2(current leads)
5. WHAT IS TRANSORMER RATIO
   A. Ratio of secondary turns of transformer to primary turns of transfomer
6. WHAT IS MEANT BY WATTLESS COMPONENT OF THE CURRENT
   A. In pure capacitor and inductive circuit phase difference between voltage and current is π/2 and cosθ=0
7. WHEN DOES LCR CIRCUIT HAVE MINIMUM IMPEDENCE
   A. At resonant frequency

CHAPTER 11 (ELECTROMAGNETIC WAVES)

1. GIVE USES OF INFRARED RAYS
   A. Used in remotes
   Used in treatment of skin diseases
   Used in satellites
2. IF THE WAVELENGTH OF ELECTROMAGNETIC RADIATION IS DOUBLED, WHAT HAPPENS TO ENERGY OF PHOTON
   A. Remains same

3. WHAT ARE THE APPLICATIONS OF MICROWAVES
   A. **Used in microwave oven**
      Used in speed guns
4. MICROWAVES ARE USED IN RADARS. WHY
   A. **Due to their short wavelength**
5. HOW ARE MICROWAVES PRODUCED
   A. **By vacuum tubes**

6. THE CHARGING CURRENT FOR A CAPACITOR IS 0.6 A. WHAT IS THE DISPLACEMENT CURRENT ITS PLATES
   A. **Displacement current = charging current**
      So its 0.6A
7. WHAT IS THE RELATION BETWEEN AMPLITUDES OF THE ELECTRIC AND MAGNETIC FIELDS IN FREE SPACE FOR AN ELECTOMAGNETIC WAVE
   A. **C=E/B**
8. WHAT IS THE RATIO OF INFRARED RAYS AND ULTRAVIOLET RAYS IN VACCUM
   A. **1:1**
9. WHAT IS THE PRINCIPLE OF PRODUCTION OF ELECTOMAGNETIC WAVES
   A. **Accelerating charged particle produces electromagnetic waves**
10. WHAT IS THE AVERAGE WAVELENTH OF X RAYS
    A. **0.1 to 100 A^0**

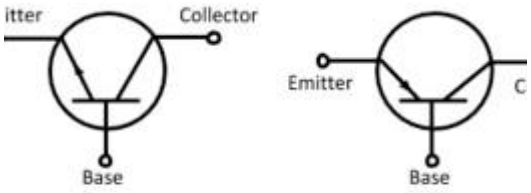
CHAPTER 12 (DUAL NATURE OF RADIATION AND MATTER)

1. WHAT ARE CATHODE RAYS
   A. **Beam of fast moving electron in a vacuum tube**
2. WHAT IS WORK FUNCTION
   A. **Minimum energy required for an electron to escape from metal surface.**
3. WHAT IS PHOTO ELECTRIC EFFECT
   A. **When light of suitable frequency falls on metal surface , electrons are emitted from it.**
4. GIVE EXAMPLES OF PHOTO SENSITIVE SUBSTANCE. WHY ARE THEY CALLED SO
   A. **Metals which exhibit photoelectric effect are photosensitive substances.λ**
      Ex. Alkali metals
5. WRITE DOWN EINSTEINS PHOTOELECTIC EQUATION
   A. **hf = kinetic energy maximum + ϕ**
6. WRITE DOWN DE BROGLIE RELATION AND EXPLAIN THE TERMS THERE IN
   A. **Λ=h/p**
      Λ = wavelength , h= plancks constant , p= momentum

7. STATE HEISENBERGS UNCERTAINITY PRINCIPLE
   A. It is impossible to measure both momentum and position of an electton simultaneously
8. AN ELECTRON , AN ALPHA PARTICLE AND A PROTON HAVE THE SAME KINETIC ENERGY. WHICH OF THESE PARTICLES HAS THE SHOREST DE BROGLE WAVE LENGTH
   A. Alpha particle
9. WHAT IMPORTANT FACT DID MILLIKAN EXPERIMENT ESTABLISH
   A. Charge is quantised

CHAPTER 15 (SEMICONDUCTOR)

1. WHAT ARE INTRINSIC AND EXTRINSIN SEMICONDUCTORS
   A. Pure semiconductors are intrinsic semiconductors.
   Impure semiconductors are extrinsic semiconductors
2. WHAT IS P TYPE SEMICONDUCTOR. WHAT ARE THE MAJORITY AND MINORITY CHARGE CARRIERS IN IT
   A. When trivalent impurity is added to pure semiconductor , it is p type semiconductor.
   Majority carriers – holes
   Minority carriers - electrons
3. WHAT IS P N JUCTION DIODE . DEFINE DEPLETION LAYER
   A. When a semiconductor is doped with trivalent impurity on one side and pentavalent impurity on other side, pn junction is formed
   A thin narrow region on either side of pn junction is depletion layer
4. WHAT IS ZENER VOLTAGE AND HOW WILL A ZENER DIODE BE CONNECED IN CIRCUITS GENERALLY
   A. When Zener diode is in reverse bias at one particular voltage, current increases. This is Zener voltage.
5. DRAW THE CIRCUIT SYMBOLS FOR PNP AND NPN TRANSISTIORS



A. ı transistor p-n-p transistor

6. IN WHICH BIAS CAN A ZENER DIODE BE USED AS VOLTAGE REGULATOR
   A. Reverse bias

7. WHICH GATED ARE CALLED UNIVERSAL GATES
   A. NAND AND NOR
8. WRITE TRUTH TABLE OF AND GATE . HOW DOES IT DIFFER FROM AND GATE

A.

Input		Output
A	B	Y=A.B
0	0	0
0	1	0
1	0	0
1	1	1

NAND output is reverse to AND output

9. WHAT IS N TYPE SEMICONDUCTOR. WHAT ARE THE MAJORITY AND MINORITY CHARGE CARRIERS IN IT

   A. **When pentavalent impurity is added to pure semiconductor , it is p type semiconductor.**
   Majority carriers – electrons
   Minority carriers – holes

10. DEFINE AMPLIFIER AND AMPLICATION FACTOR
    A. Process of raising the signal strength is amplification.
    Ratio of output voltage to input voltage of an amplifier is amplification factor.
11. WHAT HAPPENS TO WIDTH OF DEPLETION OF LAYER IN PN JUCTION DIODE WHEN IT IS FORWARD BIASED AND REVERSE BIASED.
    A. Forward bias – decreases
    Reverse bias - increases

CHAPTERS 16 (COMMUNICATION SYSTEM)

1. WHAT ARE THE BASIC BLOCKS OF A COMMUNICATION SYSTEM
   A. Transmitter, channel , receiver
2. WHAT IS SKY WAVE PROPAGATION
   A. The long distance communication achieved by reflection of radio waves from ionosphere.
3. MENTION VARIOUS PARTS OF IONOSPHERE
   A. D, E, F1, F2
4. DEFINE MODULATION. WHY IS IT NECESSARY

A. **Process of superposition of low frequency and high frequency signals.**

Necessity :

1. **To reduce size of antenna**
2. **To avoid noise pollution**

5. MENTION BASIC METHODS OF MODULATION
   A. **amplitude modulation**
      frequency modulation
      phase modulation
6. WHICH TYPE OF COMMUNICATION IS EMPLOYED IN MOBILE PHONES
   A. **Space waves**
7. WHAT IS WORLD WIDE WEB
   A. **A big encyclopedia of knowledge**
8. MENTION THE FREQUENCY RANGE OF SPEECH SIGNALS
   A. **300 Hz to 3100 Hz**

Ray Optics

1) What is dispersion which colour gets more dispersed.

A Splitting up of white light into different colours
Violet.

2) What are laws of reflection

A. 1) $\angle i = \angle r$.
2) Incident ray, reflected ray, normal lies in same plane.

3) Define focal length, radius of curvature

A) Focal length: Distance between pole and principal focus.
Radius of curvature: Distance between pole and Center.

4) What is myopia? How it can be corrected?

A. Image focused before retina.
Correction: Concave lens.

5) What is hypermetropia? How can it be corrected

A → Image focused behind retina
→ Convex lens

6) Define power, its unit.

A) Reciprocal of focal length
Unit → Dioptre $P = \frac{1}{f}$

7) A small angled prism 4° deviates a ray through 2.48°. Find refractive index

A) $\boxed{d = (\mu - 1) A}$

$2.48 = (\mu - 1) 4$

$\mu = 1.62$

8) What is optical density. How it different from mass density.

A) Optical density: measure of a materials ability to pass light
→ mass density: mass per unit volume.

9) A Concave mirror produces an image of long reduced pin, placed 10cm from mirror at the position find focal length

A) $\boxed{\frac{1}{f} = \frac{1}{u} + \frac{1}{v}}$

$\frac{1}{f} = \frac{1}{40} + \frac{1}{40}$

$f = 20\text{cm}$

10) A Concave mirror of focal length 10cm is placed at a distance of 35cm from a wall. How far from wall object be placed

A) $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

$\frac{1}{10} = \frac{1}{u} + \frac{1}{35}$

$u = 14$.

Distance $= 35 - 14 = 21\text{cm}$