UNIT – 8 – DUAL NATURE OF RADIATION AND MATTER

I. Answer in brief (2 marks)

1. Why do metals have a large number of free electrons?
2. What the types of electron emission?
3. Define work function of a metal. Give its unit.
4. What is photoelectric effect?
5. What is meant by stopping potential?
6. What is photon?
7. What is meant by threshold frequency?
8. Give the definition of Intensity of light and its unit.
9. What is photocell?
10. State de – Broglie Hypothesis.
11. Why do we not see the wave properties of a baseball?
12. What is Bremsstralung?
13. How de- Broglie wavelength associated with an electron and an α – particle having same kinetic energy related?

II. Answer in brief (3 marks)

1. Explain the types of electron emission.
2. Explain about Hallwachs and Hertz observation.
3. Explain about Lenard's observation.
4. Briefly explain how Intensity of Incident light affects the photoelectric current.
5. Write about the Laws of Photoelectric effect.
6. Explain about the Maxwell's Prediction of quantum concept of light quantisation of energy.
7. Explain Einstein Prediction "that light behave as a particle".
8. Write any three characteristics of photons.
9. Write about applications of photocell.

III. Answer in a paragraph (5 marks)

1. Briefly explain the photoelectric effect with its experiment set up.
2. Explain how frequency of incident light varies with stopping potential.
3. Explain the effect of potential difference on photoelectric effect.
4. Explain why photoelectric effect cannot be explained on the basis of wave nature of light.
5. Obtain Einstein's photoelectric equation with necessary explanation.
6. Explain experimentally observed facts of photoelectric effect with the help of Einstein's explanation.
7. Explain construction and working of photoemission cell.
8. Derive an expression for de Broglie wavelength of electrons.
9. Explain about the Principle and working of electron microscope.
10. Briefly explain Davisson – Germer experiment which demonstrated the wave nature of electrons.
11. How do we obtain characteristic x – ray spectra.