National Institute of Open Schooling
Senior Secondary
Lesson 25 – Dual Nature of Radiation and Matter
WORKSHEET – 25

Q1. Plot graph showing the variation of

A. frequency and stopping frequency
B. frequency and maximum kinetic frequency
C. frequency and current
D. frequency and current
E. Intensity and stopping potential
F. time and current

Q2. Complete the table

Element	Work function	Element	Work Function
Cs		Pb	
K		Al	
Ca		Cu	
Na		Ag	
Mo		Ni	

Q3. Define distance of closet approach. Derive an expression $r_0 = Ze(2e)/4$.

Q4. In an orbit every electron have a negative energy. What is the significance of this negative energy?

Q5. Calculate the value of Rydberg constant?

Q6. Why group 1 element of periodic table are suitable for photoelectric emission?

Q7. For head to head interaction of Gold nucleus and alpha particle. The closet distance of approach is $4*10^{-4}$ .Calculate the kinetic energy of alpha particle

Q8. What are the limitation of Rutherford model?

Q9. State whether the following statement are true or false

- The photoelectron emitted per unit area from the emitting surface vary linearly with the intensity of light
- If the frequency of the incident light increase the maximum K.E. of photoelectron also increase
- In photoelectric tube ,contain a semi cylindrical cathode and an anode in form of a straight wire
- Saturation current is determined by the intensity of incident light
- matter waves are not same thing as De Broglie waves
- matter waves faster than light

Q10. Calculate the maximum kinetic energy of the emitted photoelectron when light of frequency $V=10^{20}$ hz .The work function of Zinc is 3.4 eV