

PS Vth Sem
Element of Modern Physics
Assignment.

30/10/23

Total marks
(10)

Q1 Give the Probability interpretation of wave function and show that probability density P and probability current density J satisfies the continuity equation

$$\frac{\partial P}{\partial t} + \nabla \cdot J = 0$$

Q.2. Discuss Heisenberg's Gamma Ray Microscope and describe its two limitations?

Q.3 Discuss liquid drop model of the nucleus and hence derive the semi empirical mass formula. Describe its all constants? Draw graph between $B.E./\text{nucleon}$ vs atomic mass no.

Q.4 A beam of particles each of mass m and energy E is incident on the potential barrier

$$V(x) = \begin{cases} 0 & x < 0 \\ V_0 & 0 < x < a \\ 0 & x > a \end{cases}$$

(a) Show that there is non zero probability of transmission even if $E < V_0$

(b) Find transmission and Reflection coefficient for $E < V_0$ and

(c) Draw wave nature for $E < V_0$ and $E > V_0$.

Q.5) Discuss the aim, apparatus and the results of the Davisson German Experiment?


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