KATWA COLLEGE

DEPARTMENT OF PHYSICS

INTERNAL ASSESSMENT EXAMINATION - 2024

B.Sc. (H), SEMESTER: - IV,

PAPER:- CC-IX (ELEMENTS OF MODERN PHYSICS)

F.M: 10 **TIME: 1 HOUR**

❖ **Answer any five from the following questions: - 5 x 2 = 10**

1. What is the binding energy of a nucleus? Draw the curve of binding energy per nucleon with mass number.
2. What is spectral radiancy? Plot the variation of spectral radiancy with the frequency of black body radiation.
3. Show that the dimensions of Planck's constant are the same as those of angular momentum.
4. Find the radius of ^{64}Cu, given the radius of ^{27}Al is 3.6 fermi.
5. Write down any two important experimental features of photoelectric effect?
6. Assuming that 1u = 1.66 x 10^{-27} Kg and the radius of the nucleus to be given by $R = r_o A^{1/3}$, where r_o = 1.2 x 10^{-15} m, calculate the density of nuclear matter.
7. A proton is bound to a heavy nucleus with a binding energy 1 Mev. Calculate the wavelength of a photon needed for removing the proton from the nucleus.
8. When a light beam of wavelength $\lambda = 4000\ \dot{A}$ falls on a metal plate, if the stopping potential is 1.5 volt, calculate the work function of the metal plate.