TEST SERIES (PHYSICS)

MM30   DUAL NATURE,NUCLEUS AND ATOM   MT1H

Q1.A proton and an alpha particle both initially at rest are accelerated so as to have the same kinetic energy. What is the ratio of their De Broglie wave length.(1)

Q2.Maximum velocity of electron emitted from a metal of negligible work function is v when a radiation of frequency f falls on it. what would be the velocity of electrons when a radiation of frequency 4f falls on same metal surface.(1)_

Q3.Find the ratio of densities of two nuclii of which mass number are 27 and 64.(1)

Q4.Calculate the half life of a radioactive substance of which the activity drops to $1/16^{th}$ of its initial value in 30 years.(1)

Q5.For which transition shortest wavelength of Balmer series belongs?(1)

Q6. Write the points which indicates that photo electric effect proves to particle nature of light.(2)

Q7.A radiation of wavelength λ falls on a metal surface of negligible work function. Find the deBroglie wavelength associated with emitted electrons.(2)

Q8. Draw a graph showing the variation of potential energy between a pair of nucleons as a function of their separation. Indicate the regions in which the nuclear force is (i)attractive(ii)repulsive(2)

Q9.Why is the mass of a nucleus always less than the sum of masses of its constituents, neutrons and protons. If the total number of neutrons and protons in a nuclear reaction is conserved, how then the energy absorbed or evolved in the reaction?(2)

Q10.By using the concept of deBroglie wavelength prove the Bohrs condition of quantization condition of angular momentum of an electron in an orbit.(2)

Q11. Derive an expression for the total energy of an electron in any orbit of hydrogen atom according to Bohr's model. what the negative sign signify?(3)

Q12.Find the kinetic energy of electron in second excited state of hydrogen atom?If the electron jump to ground state from second excited state, find the wavelength of the spectral line emitted? (3)

Q13.Sample A and B having the half lives 1h and 2h respectively. Initially both are having the equal number of undecayed nuclii. Find the ratio of their rate of reaction after 2hour. (3)

P.T.O.

Q14.A heavy nucleus X of mass number 240 and binding energy per nucleon 7.6MeV is splitted in to two fragments Y and Z of mass numbe r 110 and 130 .Binding energy per nucleon of Y and Z is 8.5MeV per nucleon.Calculate the energy released per fission.   (3)

Q15.Stopping potential vs frequency graph for two metals has been given.
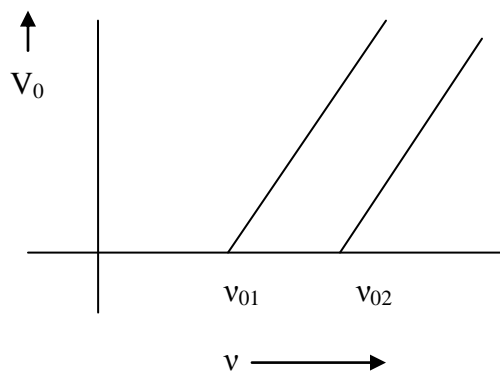
(A)When the same radiation falls on both the metal surfaces the stopping potential of emitted electrons are found to be V_1 and V_2.Which one is greater?

(B) Find the slope in terms of V_1, V2,ν_{01},ν_{02} (3)