**IB Physics**

**FA27.2 - Atomic and Particle**

Name

Best Reason to Conform

**Show your work, circle your answers, and use sig figs to receive full credit.**

1. How fast must an alpha particle (m = 6.64x10−27 kg) go to get within 5.0x10-15 m of an Iron nucleus (Z = 26)

2. What is the wavelength of the photon associated with an electron transition from n = 2 to n = 7 in a hydrogen atom? Is the photon being absorbed, or emitted?

3. What is the radius of U-235?

If the uncertainty of an electron's position is 1.20x10-10 m, what is the minimum uncertainty (the total range) of its velocity?

4. For the decays, find the missing particle. For the reactions, indicate if it is possible, or indicate every law it violates:

|  |  |  |  |
| --- | --- | --- | --- |
| μ+→ ?? + υe +  e+ | μ+ → e+ + ?? + + e+ + e-  υe | p + p → p + n + + Λo  yes | p + n → K+ + n + n + n +  No, charge, strangeness |

5. Write the quark combinations that make up a proton and a neutron: p = n =

Identify the following quark combinations as either a meson, or a baryon. Determine the baryon number, strangeness, and the charge of each:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Baryon or Meson? | B = ? | S = ? | q = ? |
| usb | B | 1 | -1 | 0 |
| d | M | 0 | +1 | 0 |
| uuc | B | 1 | 0 | +2 |
| c | M | 0 | 0 | 0 |