1. Suppose that I have 4000 hydrogen nuclei. Approximately how many ^{4}He nuclei would have the same mass?

    A. 911
    B. 993
    C. 1000
    D. 1007
    E. 1986

Answer: D

2. Suppose that things had gone differently during nucleosynthesis, so that after the 1st 3 minutes of the universe, when the temperature become low enough for protons and neutrons to "stick" to make nuclei, we has 1 neutron for every 19 protons. What would be the helium abundance of the universe by mass?

    A. 5%
    B. 10%
    C. 20%
    D. 40%
    E. 60%

Answer: B

3. The electron in a ground state hydrogen atom exists somewhere in a quantum mechanical "probability cloud", at an average radius of 5.3×10^{-11} m from the nucleus of the atom. Estimate how fast the electron is moving relative to the speed of light. ("c" is the speed of light.)

    A. 1×10^{-5} c
    B. 0.01c
    C. 0.1c
    D. 0.5c
    E. 0.98c

Answer: B

4. The total amount of energy released by Type 1 supernova is about 10^{44} J. How long would the Sun have to shine at its present luminosity to release this much energy?

    A. 4Myr
    B. 2Gyr
    C. 8Gry
    D. 15Gyr
    E. 120Gyr

Answer: C