

Brett Robbins Academic Consulting

# Physics 30 Practice Test

## Unit D: Atomic Physics

5 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

**This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.**

### Question 1

In the gold foil experiment, most alpha particles passed straight through the foil, while a small number were deflected through large angles. This evidence led Rutherford to conclude that an atom

- A) is mostly empty space, with nearly all of its mass and positive charge concentrated in a tiny central nucleus
- B) consists of electrons embedded in a sphere of uniform positive charge
- C) has electrons travelling in fixed circular orbits of any radius
- D) is a solid, indivisible sphere

### Question 2

When a nucleus undergoes beta negative decay, the change to the nucleus is

- A) the atomic number increases by 1 and the mass number is unchanged
- B) the atomic number decreases by 1 and the mass number is unchanged
- C) the atomic number decreases by 2 and the mass number decreases by 4
- D) the atomic number is unchanged and the mass number decreases by 1

### Question 3

A radioactive sample has a mass of 480 g and a half – life of 6.0 days.

The mass of the original sample remaining after 18 days, in grams, is

Question 4

Selected energy levels for a hydrogen atom are  $E_1 = -13.6 \text{ eV}$ ,  $E_2 = -3.40 \text{ eV}$ ,  $E_3 = -1.51 \text{ eV}$ , and  $E_4 = -0.85 \text{ eV}$ . An electron drops from the  $n = 3$  level to the  $n = 1$  level. The energy of the emitted photon is

- |            |            |
|------------|------------|
| A) 10.2 eV | B) 1.89 eV |
| C) 12.1 eV | D) 15.1 eV |

Question 5

Gamma radiation is best described as

- |                            |                            |
|----------------------------|----------------------------|
| A) a helium nucleus        | B) a high – speed electron |
| C) a high – speed positron | D) a high – energy photon  |

# Answer Key

- |      |       |      |
|------|-------|------|
| 1. A | 3. 60 | 5. D |
| 2. A | 4. C  |      |

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