**GATITU MIXED SECONDARY SCHOOL**

**CHEMISTRY F4**

**OPENER EXAM (Radioactivity)**

**TERM II 2015**

INSTRUCTIONS

Answer all questions.

1. Complete the following equation by determining the values of **U** and **V**. (2 mks)

u

v

234

90

 0

-1

 **Th**   **Pa** +  **e**

 U……… V……………..

2. (a) Distinguish between nuclear fusion and fission (2 mks)

 (b) Compete the nuclear equation below:- (1 mk)

230 230

90 91 **+**

3. Uranium -238 disintegrates by emitting an alpha particle to form substance **Y**.

 Nuclide **Y** emits a beta particle to form substance **Z**. Write down nuclear equations to show how

 substance **Y** and **Z** are formed (U=Atomic No. 92) (2 mks)

4. (a) What is a nuclide? (1 mk)

 (b) The graph below shows the radioactive decay of a certain nuclide. Determine the

 half-life of the nuclide (2 mks)

5. (a) State **one** way in which nuclear reactions differ from ordinary chemical reactions (1 mk)

 (b) The following is a part of Uranium decay series

238

  **U**

92

234

  **Th**

90

234

  **Pa**

91

Z

  **X**

A

Step I

Step II

Step III

 (i) Which particles are emitted in **step I** and **II** (1 mk)

 (ii) If a beta particle is emitted in **step III,** find **Z a**nd **A** (1 mk)

 (iii) If the activity of Thorium -234 is reduced to 25% in 48hours, find its half life (2 mk)

7. Some **two** elements are represented as:

16 27

 and

8 13

 (a) How many protons does **X** have? (1 mk)

 (b) How many neutrons does **Y** have? (1 mk)

8. **Y** grams of a radioactive isotope take 120days to decay to 3.5grams. The half-life period

 of the isotope is 20days

 (a) Find the initial mass of the isotope (2 mks)

 (b) Give **one** application of radioactivity in medicine (1 mk)