NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, Plot 91 Cadastral Zone, Nnamdi Azikiwe Express Way, Jabi - Abuja.

FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCES
JULY 2017 EXAMINATION

COURSE CODE: **CHM 406**
COURSE TITLE: **Nuclear Chemistry**
COURSE UNIT: **2 Units**
TIME: **2 Hours**
INSTRUCTION: **Question one is compulsory. Answer question one and any other three questions.**

1ai) Discuss briefly the concept of neutron- to – proton ratio.
(5 mks)

1aii) Highlight the three rules that guide the prediction of nuclear stability.
($4^1/_2$ mks)

1bi) What do you understand by" radioactive" decay?
(4 mks)

1bii) Explain briefly the meaning of radiological dating.
(3 mks)

1c) During a nuclear reaction between atomic nucleus and another particle, three different processes are possible. State and describe briefly these processes.
($4^1/_2$ mks)

1d) What are Tracks?

(4mks)

QUESTION TWO

2a) Write short notes on various sub-atomic particles that can be emitted by nuclei in the following condition so as to enter stability belt.

i) Above the stability region
ii) Below the stability region

(15 mks)

QUESTION THREE

3a) Compare and contrast between nuclear and chemical reactions.

(4 mks)

3b) State and expatiate briefly the conservation laws that hold in radioactive decay.

($7^1/_2$ mks)

3c) What is a potential well? Explain briefly.

($3^1/_2$ mks)

QUESTION FOUR

Write short notes (with chemical equation where necessary) on the followings:

Nuclear fission
Nuclear fusion
Gamma ray emission
Atomic energy
Decay chain
Decay energy

(15 mks)

QUESTION FIVE

5ai) Comment on health disorders associated with exposure to radiation.

(4 mks)

5aii) List any two sources of exposure to radiation in humans.

(2 mks)

5b) State the three basic principles recommended for keeping radiations exposure to a minimum level.

(3 mks)

5c) Enumerates on the three stages of protection measures to radiation exposure, in large organisations

(6 mks)