ELIZADE UNIVERSITY,
ILARA-MOKIN, NIGERIA

FACULTY: BASIC & APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

FIRST SEMESTER EXAMINATION

2020/2021 ACADEMIC SESSION

**COURSE CODE:** EMT 515

**COURSE TITLE:** RADIONUCLIDES IN THE ENVIRONMENT

**COURSE UNIT(S):** 2 UNITS

**DURATION:** 2 HOURS

HOD's SIGNATURE

NAME:.....

MAT. No:.....

**INSTRUCTIONS:**

ANSWER ANY FOUR QUESTIONS

a) Define radionuclides and give two other terms by which radionuclides are known.
b) State five sources of radionuclides in the environment.
c) Write briefly on decay chain.

2. a. (i) List three types of natural radionuclide.
(ii) Give a short note on any type of natural radionuclide, stating its origin and two examples.
b. Explain the following terms:
(i) Natural radioactivity
(ii) Artificial radioactivity
c. (i) Write on artificial radioactivity under the heading:
(ii) Reasons for its needs
(iii) Means of producing artificial radionuclides.

3. a. Give a brief account of the Chernobyl disaster.
b. (i) What are nucleons?
(ii) In a tabular form, state the name, charge and mass of nucleons present in radionuclides.
(iii) Given $^{238}_{92}U$, how many nucleons are present in it?

4. a. State two differences between each pair below.
(i) α particle and β particle
(ii) ordinary chemical reaction and nuclear reaction
(iii) nuclear fission and nuclear fusion.
(iv) parent isotope and daughter isotope.
b. Explain the following, giving an equation to support each.
(i) electron capture
(ii) beta decay

5. a. (i) What is half-life of a radionuclide? Give the formula for half-life.
(ii) Define activity of a radioactive decay.
b. After 14 decays, a radionuclide remained 0.05 g. Determine the:
(i) initial mass
(ii) fraction that has decayed.
c. Give a short note on:
(i) a means of measuring radioactivity
(ii) one analytical use of radioactivity.