COURSE CODE: CHM 303
COURSE TITLE: INORGANIC CHEMISTRY III
COURSE UNIT: 3
TIME: 2½ HOURS
INSTRUCTION: Answer question one and any other four questions.

QUESTION ONE

1ai. Define Radioactivity   (1Mark)
1aii. List 3 characteristics of radioactivity   (3 Marks)
1b. Mention and explain 3 types of radiation.   (6 Marks)
1c. State valence bond theory.   (2 Marks)
1di) Name any 6 scientists that championed the discovery of noble gas
     and their major contribution   (6 Marks)
1dii) Explain Magnetic property of transition element   (4 Marks)

QUESTION TWO

2a) List 4 characteristics of molecular orbital theory   (4Marks)

2b) State 3 differences between valence bond theory and molecular bond theory   (3Marks)

2c) Write short note on the chemical properties of lanthanide.   (5Marks)

QUESTION THREE

3ai) State the physical properties of noble gases   (2Marks)
3aii) Noble Helium gas is unique in being the first element to be discovered extra-terrestrially before being found on the earth. Discuss   (4Marks)
3b) Itemize the contributions of William Ramsay in new conventional periodic table
                                                                   (4Marks)

3c) How can the position of noble gas group be justified?   (5Marks)

QUESTION FOUR

4) Write short notes on the following metal purification process:

    i. Liquation   (3Marks)

    ii. Distillation   (2Marks)

    iii. Electrolysis   (3Marks)

    iv. Zone Refining   (4Marks)

QUESTION FIVE

5a) State the isotopes of oxygen and the neutron number of each of them. (3Marks)

5b) Establish three differences between oxygen and sulphur. (3Marks)

5c) Write the electronic configuration Sc^{3+}, Zn^{2+} and Cu^+ and explain their possible colours.

(6Marks)

QUESTION SIX

6) Discuss the extraction process of the following transition metals using equations from their ores.

    (i) Titanium   (3Marks)

    (ii) Chromium   (3Marks)

    (iii) Nickel   (3 Marks)

    (iv) Copper   (3 Marks)