ELIZADE UNIVERSITY, ILARA – MOKIN, ONDO STATE, NIGERIA
DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES
FIRST SEMESTER EXAMINATIONS: 2020/2021 ACADEMIC SESSION
COURSE CODE: CHM 201   COURSE TITLE: INORGANIC CHEMISTRY I
HOD's SIGNATURE

DURATION: 2HOURS
INSTRUCTIONS:
  1. *SECTION A: ATTEMPT QUESTION ONE AND ANY OTHER QUESTION*
  2. *SECTION B: ATTEMPT TWO QUESTIONS*

SECTION A

ATTEMPT QUESTION ONE AND ANY OTHER

1.
a. How is the actual tissue damage by radioactivity quantified? [2marks]
b. Arrange the following particles in order of their penetrating power. Justify your answer. Beta, alpha, positron particles and gamma rays. [2marks]
c. Write a balanced equation for the conversion of gypsum to plaster of Paris (POP). State the importance of this reaction. [2marks]
d. Complete and balance the following equations:
i. $Mg_3P_2 + HCl \rightarrow$ [1mark]
ii. $CaH_2 + H_2O \rightarrow$ [1mark]
iii. $Be^{+2}_{(aq)} + OH^-_{(aq)} \rightarrow$ [1mark]
iv. $Xe_{(s)} + F_{2(g)} \rightarrow$ [1mark]
e. Mention two applications of radioactivity and state the characteristics of the radioactive nuclides employed. [3marks]
f. State one method by which the emission of Sulphur dioxide gas is minimized during the roasting of sulphide ores [1mark]
g. State the properties of an ore which is to be concentrated by
i. Leaching with an alkali [1mark]
ii. Leaching with acid [1mark]
iii. Froth flotation [1mark]
iv. Panning [1mark]
h. Explain why the compounds of Beryllium are covalent and those of the other group II elements are predominantly ionic. [2marks]

2.
a. Discuss the socio – economic impact of mining and extraction of metals on the environment. [8marks]
b. Suggest an alternative and profitable way of producing useful metals without mining and extraction processes. [2marks]

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3.

a. Outline a method of extraction of Aluminum from its most abundant ore Bauxite.
   [6 marks]

b. Discuss ways by which emissions from radioactive nuclei interact with matter [4marks]

SECTION B

4.

a. Briefly comment on these statements:
   i. The melting and boiling points of the transition elements are usually high [2 marks]
   ii. The decrease in atomic radius from sodium to chlorine is greater than that of scandium to copper [2 marks]
   iii. Attempt to fit hydrogen into any particular group in the periodic table is subjective [3 marks]
   iv. It is not possible to measure standard electrode potentials absolutely [3 marks]

b. With the aid of chemical equations, discuss three methods for the preparation of hydrogen [5 marks]

5.

a. With the aid of chemical equations, explain why $AgCl$ is more soluble in water than in the solution of $NaCl$. [6 marks]

b. With the aid of relevant equations, discuss the reactions of magnesium with: (i) hydrogen (ii) water (iii) nitrogen [6 marks]

c. Briefly discuss the anomalous behaviour of Beryllium [2 marks]

d. State four differences between diamond and graphite [4 marks]

e. Explain briefly why Zn and Cd are soft metals [2 marks]

6. Discuss the properties of transition elements under the following headings:

a. Variable oxidation state [4 marks]

b. Magnetic properties [4 marks]

c. Formation of coloured ions [4 marks]

d. Complex formation [4 marks]

e. Catalyst [4 marks]