KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF BED (SCIENCE)

COURSE CODE: SCH321*/ 328

COURSE TITLE: CO-ORDINATION CHEMISTRY

DURATION: 2 HOURS

DATE: 8/10/2021 **TIME: 8:00-10:00AM**

INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of **4** printed pages. Please Turn Over

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QUESTION ONE (30 MARKS)

1 a). Define the following terms as used in coordination chemistry [4 marks]

i. Chelate

ii. Ligand.

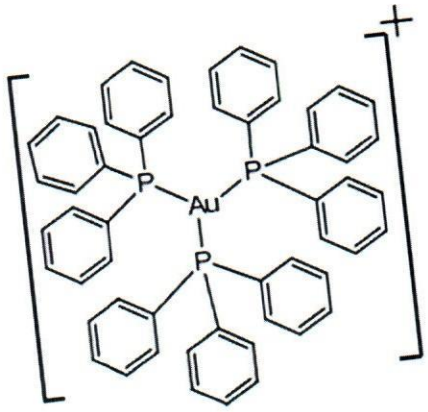
iii. Co-ordination sphere

iv. A complex

b). Names four complexes used in cancer treatment [2 marks]

c). Explain the coordination number, hybridization and shape structure of the compound [3 marks]

below



d). Giving examples distinquish between homoleptic and heteroleptic complexes [3 marks]

e). What is EDTA in full and draw its structure [3 marks]

f). State the various method that are used in synthesizing coordination compounds. [4 marks]

g). Draw the geometric isomers form $[PtCl_2(NH_3)_2]$ [4marks]

h). State three factors that Affect Stability of Metal Complexes [3 marks]

i). Name the following complexes as used in coordination chemistry [4marks]

i. $[Ni(CO)_4]$

ii. $[Cu(NH_3)4(H_2O)_2]SO_4$

iii. $[Cu(NH_3)_4Cl]Cl_2$

iv. $K_3[Fe(SCN)_6]$

QUESTION TWO (20 MARKS)

2 a). Explain steps involved in formation of a complex ML_n, stepwise and overall stability constants [10 marks]

b) State and explain five types of ligands giving examples for each ligand [10 marks]

QUESTION THREE (20 MARKS)

3 a). State three examples of biological complexes that found in living organisms [3 marks]

b).Explain the application of coordination compounds in our modern world [10 marks]

c). Differentiate between the following complexes terminologies [7 marks]

i. Thermodynamic stability and kinetic stability

ii. Diamagnetism and paramagnetism

iii. Primary and secondary valences

QUESTION FOUR (20 MARKS)

4 a).Explain seven types of isomerism possible for coordination compounds, giving example of each [14 marks]

b).State four factors which influence the stability of chelates [4 marks]

c).Give the product of the following reactions [2 marks]

i. $[Cu(CN)_2]^- + 2CN^-$ .....

ii. $[Ag(NH_3)]^+ + 2NH_3$.....

QUESTION FIVE (20 MARKS)

a. Discuss the following reactions in the in preparation of metal complexes. [4 marks]
   i Substitution reaction
   ii. Redox reaction
b. State four limitations of valency bond theory [4 marks]
c. Explain two factors affecting the stability of metal complexes [4 marks]
d. Explain properties of the ligand affect the stability of the metal complexes [8 marks]