



KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF CHEMISTRY

COURSE CODE: SCH 413

COURSE TITLE: BIO – INORGANIC CHEMISTRY

DURATION: 2 HOURS

DATE: 9TH NOVEMBER, 2020

TIME: 9:00AM-12:00PM

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 3 printed pages. Please Turn Over



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QUESTION ONE.

[a]. Outline the biological functions of the following

- i. Ca.....2mrks
- ii. P other than being a component of Vitium B₁₂.....3mrks
- iii. I.....2mrks
- iv. F.....2mrks
- v. Sulphur.....2mrks

[b]. Explain what you understand by the following

- i. Dinitrogen fixation.....1mrk
- ii. Biological nitrogen fixation.....2mrks
- iii. State clearly the necessary condition for biological nitrogen fixation.....3mrks
- iv. During biological nitrogen fixation, it's presumed that dinitrogen is coordinated to one of the transition metals.
 - a. List the two metals found in the most nitrogeneoses.....2mrks
 - b. Give two examples of dinitrogen complex which show that dinitrogen can eventually have as a ligand.....2mrks.
 - c. Describe a simple experiment that support the idea that before dinitrogen is converted to ammonia, it is actually coordinated to one of these metal ions.....10mrks.

QUESTION TWO

[a]. Vitamin B₁₂ is a naturally occurring organometallic complex. support this statement by drawing the structure of the prosthetic group showing clearly this Vitamin.....15mrks.

[b]. State the biological role of this vitamin.....5mrks.

QUESTION THREE.

(a). Draw a structure of the prosthetic group in myoglobin showing clearly all the main feature.....10marks.

(b). Differentiate between myoglobin and haemoglobin and specify the biological function of these molecules.....10marks.

QUESTION 4

[a]. Using examples, discuss the role of biomolecules in the photosynthesis process under the following sub topics.....10marks.

- I. Chlorophyll (structure and functions)
- II. Role of Mn in photosynthesis
- III. Mg in porphyrin

[b]. Discuss the role of nitrogenase in nitrogen fixation metal complexes.....10mrks.

QUESTION 5.

[a]. Briefly describe the toxicity due to Co on the "heme".....4mrks

[b]. Using diagrams, describe the intake of oxygen by deoxyhemoglobin and the release of oxygen by hemoglobin.....16marks.

αα
ββ
γγ

- Indicate .
- Start every 4

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