KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER
SUPPLIMENTARY EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 214

COURSE TITLE: BIOCHEMISTRY

DURATION: 2 HOURS

DATE: 11/10/2018 **TIME:** 8 – 10AM

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

QUESTION ONE [30 MARKS]

1 a) Define the following terms as used in biochemistry. (5marks)

I). Glycolysis

II). Transcription

III). Glycosidic bonds

IV). Enantiomer

V). Enzymes

b). State and explain the functions of proteins (4marks)

c). Draw the Fischer projections of D and L isomers of glycine (4marks)

d). Differentiate between the following terms. (4marks)

i. Oligosaccharides and polysaccharides

ii. Amylose and Amylopectin

e).Using illustrations, describe the structure of a nucleotide. (3marks)

f). State and explain how hemiacetal and hemiketal are formed. (4marks)

g). Draw and name the structure of D family of glucose and its cyclic form after mutarotation of the open- chain hydroxyl aldehyde of glucose. (4marks)

h) Lactic acid can be isolated from sour milk. Is lactic acid chiral (2marks)

QUESTION TWO [20MARKS]

a). Explain how the following biochemical techniques are used in identification and separations.

i). Paper chromatography of amino acids (10marks)

ii). differential precipitation of proteins (5marks)

b) Electrophoresis of a mixture of lysine, histidine, and cysteine which has the following isoelectric point 9.74, 7.64 and 5.02 respectively is carried out at PH 7.64. Describe the behavior of each amino acid under these conditions (5marks)

QUESTION THREE [20MARKS]

a). Explain in detail the classification of carbohydrates (5marks)

b). Giving an example in each case differentiate between cellulose and glycogen (4marks)

c). There are two forms of enzyme inhibition namely Competitive and Noncompetitive inhibition.Discuss these two forms (5marks)

d). Describe the following interactions in protein structures (4marks)

i). Hydrogen bonding

ii). Hydrophobic interactions

iii). Dipole-dipole attractive forces.

iv). Salt bridges

f). State the two major functional groups present in carbohydrates and amino acids. (2marks)

QUESTION FOUR [20MARKS]

Describe the process of glycolysis. (20marks)

QUESTION FIVE [20MARKS]

a).What is a nucleotide, and what three kinds of components does it contain? (4marks)

b). Draw and name Fischer projections for the four aldotetroses, which are D and L-monosaccharides and which are enantiomers. (8marks)

c). Name the type of covalent bonds joining monomers in these biopolymers (2marks)

i).Starch

ii).Deoxyribo nucleic acids molecule

d). Draw zwitterion of Isoleucine which is an amino acid (2mark)

e) Explain the mechanism of reaction of the enzyme (4marks)