JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF BIOLOGICAL SCIENCES

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCES IN BIOLOGICAL SCIENCES

2nd YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: SBI 3215

COURSE TITLE: BIOCHEMISTRY 1

EXAM VENUE: LAB 6 **STREAM: (BIO)**

DATE: 20/04/17 **EXAM SESSION: 9.00 -11.00 AM**

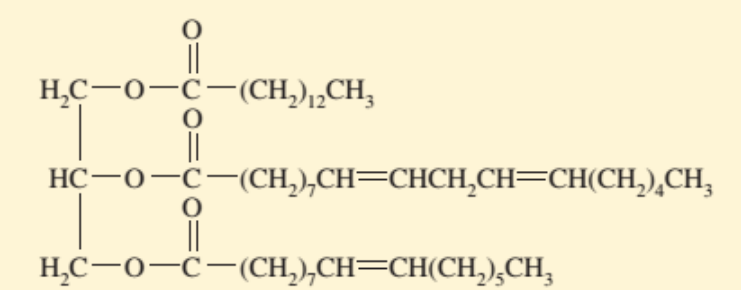
TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in Section A and Any two questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Using an appropriate diagram, outline how DNA nucleotides are linked together by covalent bonds into a single strand. (3 Marks)
2. Draw the *cis* and *trans* isomers for palmitoleic acid having the formula $CH_3(CH_2)_5CH=CH(CH_2)_7COOH$. (3 Marks)
3. Write projection formulas for (a) an L-aldotriose, (b) a D-ketotetrose, and (c) a D-aldopentose. (3Marks)
4. Define the following terms zwitterion, anomer and enantiomer. (3 Marks)
5. Describe the ionization state of amino acids as a function of Ph. (3 Marks)
6. Write the structure of the tripeptide Ser-Gly-Ala and give its full name. (3 Marks)
7. What is a chiral carbon atom? Draw structural formulae of fructose and mark the chiral carbon with an asterisk. (3 Marks)
8. What is the significance of the notations D , L, (-), and (+) in the name of a carbohydrate? (3 Marks)
9. Glyceraldehyde in the simplest aldose sugar. Write a Fischer projection formula for this aldose. If there are any chiral carbons in this molecule, show all isomers. (3 Marks)
10. Name the fatty acids used in the syntheses of the following triacylglycerol, and indicate which one could be classified as an w-6 fatty acid:



(3Marks)

SECTION B: ESSAY QUESTIONS (40 MARKS).

11. Describe Krebs and Calvin Cycles. (20 Marks)
12. Using appropriate structures, describe the various ways in which amino acids are classified. (20 Marks)
13. Discuss the digestion and absorption of lipids (20Marks)
14. Describe the glycolysis pathway (20 Marks)