



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER**

**SCHOOL OF SCIENCE
BACHELOR OF SCIENCE IN CHEMISTRY**

COURSE CODE: CHE 2216

COURSE TITLE: BIOCHEMISTRY

DATE: 25TH APRIL 2018

TIME: 0830 - 1030 HRS

INSTRUCTIONS

Answer Questions One and Any Other Two

QUESTION ONE (30 MARKS)

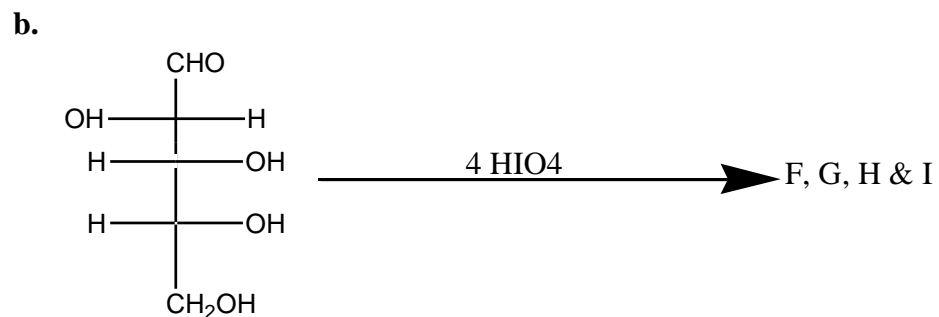
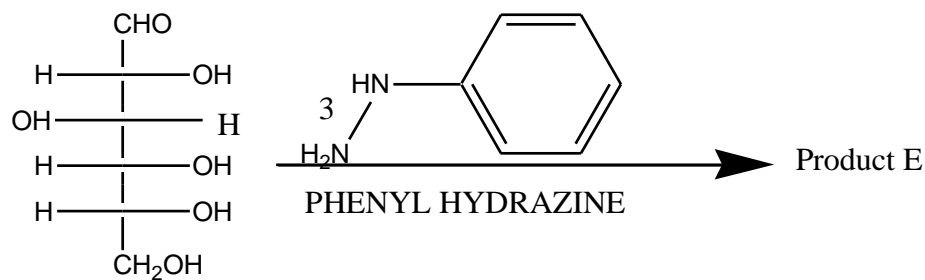
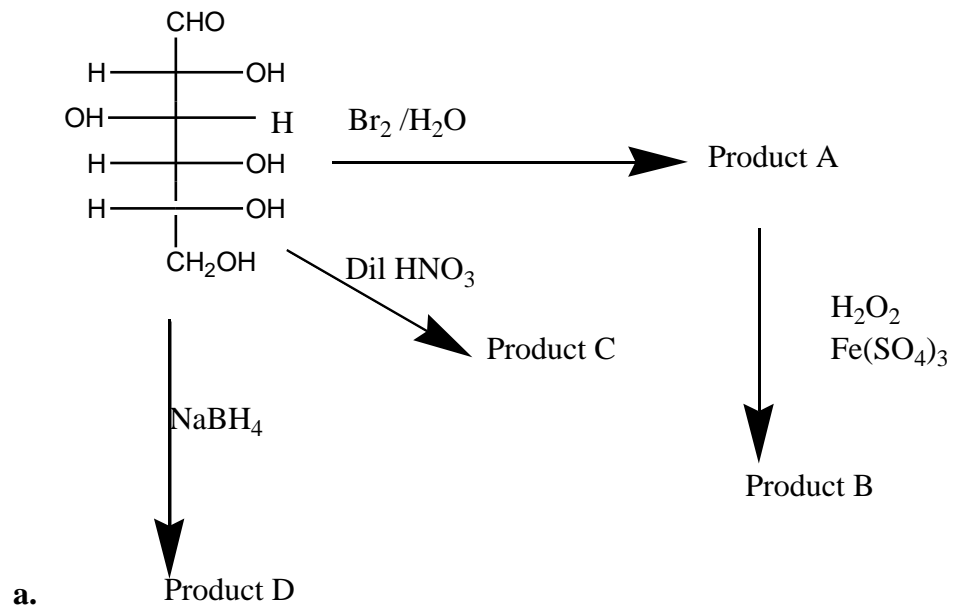
- a) Define the following terms giving examples where applicable **(5 MARKS)**
- i) Glucosidic linkage
 - ii) Mutarotation
 - iii) Carbohydrates
 - iv) Anomeric carbon
 - v) Oligosaccharides
- b) State four characteristics of monosaccharides **(4 MARKS)**
- c) The specific optical rotation of pure alpha and beta- D mannopyrose are $+29.3^{\circ}$ and -17.0° respectively. When either form is dissolved in water the observed rotation of the solution changes until a final rotation of $+14.2^{\circ}$ is observed. Calculate the percentage of each isomer at equilibrium assuming that only alpha and beta pyranose forms are present in the solution **(5 MARKS)**
- d) Differentiate between the following terms giving examples in each case **(6 MARKS)**
- i) Dextrorotatory molecules and levorotatory molecules
 - ii) Enantiomers and diastereomers
 - iii) Epimers and anomers
- e) Differentiate between the two major classes of nucleic acids **(4 MARKS)**
- f) State and explain the importance of Lipids **(4 MARKS)**
- g) Define electrophoresis and state its importance in Biochemistry **(2 MARKS)**

QUESTION TWO (20 MARKS)

- a) Starting from the Fischer projection, draw the cyclic hemiacetal forms of D- galactose both as a chair conformation and Haworth projection. Galactose is the C4 epimer of glucose. **(5 MARKS)**
- b) Explain using examples why basic reactions are NOT useful in sugar chemistry **(5 MARKS)**
- c) Discuss giving examples **FIVE** classes of lipid **(10 MARKS)**

QUESTION THREE (20 MARKS)

- a) Sucrose, lactose and maltose are three common disaccharides. Give the two monosaccharides units that make each of the above disaccharides. **(3 MARKS)**
- b) Explain why a blue colour is observed when reacting amylose with iodine **(2 MARKS)**
- c) Sucrose is a non reducing sugar whereas the disaccharides are reducing sugars. Explain **(4 MARKS)**
- d) Define polysaccharides and give two examples **(3 MARKS)**
- e) Give the products of the following reactions **(8 MARKS)**



QUESTION FOUR (20 MARKS)

- a) Differentiate between the following terms giving examples where applicable.
- Glycerol phospholipids and sphingophospholipids **(4 MARKS)**
 - Catabolism and anabolism **(4 MARKS)**
 - Fats and oils **(4 MARKS)**
- b) Discuss atleast three classes of amino acids giving an example in each case **(6 MARKS)**
- c) Glycine is the simplest form of amino acids, give its Zwitterionic form **(2 MARKS)**

END//