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MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN /TURKANA CAMPUS

UNIVERSITY EXAMINATIONS 2023/2024 ACADEMIC YEAR

MAIN EXAM

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BSC. HUMAN NUTRITION AND DIETETICS

COURSE CODE: **HND 302**

COURSE TITLE: **FOOD CHEMISTRY**

DATE: 14/12/2023 **TIME:** 12:00-2:00 PM

INSTRUCTIONS TO CANDIDATES

Answer **ALL** questions in SECTION A and B
Answer only **TWO** questions in SECTION C
Read additional instructions under various sections

TIME: 2Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

SECTION A: 10 MULTIPLE CHOICE QUESTIONS EACH 1 MARK –TOTAL 10MARKS

1. Which of the following is **NOT** a fat-soluble vitamin?
   A. Vitamin A
   B. Vitamin K
   C. Vitamin E
   D. Vitamin C
2. Which of the following temperatures does not permit the growth of most microorganisms.
   A. ≤ 0.80
   B. ≤ 0.70
   C. ≤ 0.60
   D. ≤ 0.50
3. Natural proteins contain up to 21 different primary amino acids linked together via _____ bonds.
   A. hydrogen
   B. covalent
   C. amide
   D. ionic
4. The following are non-essential amino acids **EXCEPT**?
   A. Serine
   B. Threonine
   C. Cysteine
   D. Tyrosine

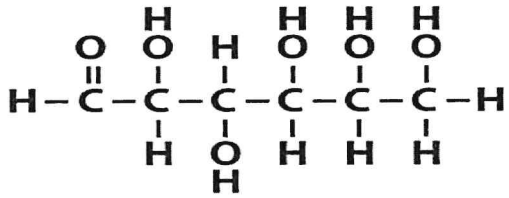

Figure 1: monosaccharide. (Use this figure for question 5 and 6).

5. The monosaccharide in figure 1 above is a:
   A. Double sugar
   B. Ketose
   C. Aldose
   D. Both A and B
6. The monosaccharide in figure 1 above can be classified as_____ based on its number of carbon atoms.
   A. nonose
   B. heptose
   C. octose
   D. hexose
7. Which of the following process helps reduce lactose in milk for lactose intolerant individuals?
   A. Fermentation of milk
   B. Acidification using natural citric acid
   C. Dehydrating milk into milk powder
   D. Condensation of milk
8. _____ oil is high in oleic acid.
   A. Canola
   B. Soybean

C. Corn
D. Coconut

9. The precursor for the synthesis of bile acids is;
   A. Linoleic acid.
   B. Phospholipid.
   C. Cholesterol.
   D. Spingolipid.
10. Which of the following is the most common form of vitamin E with the highest vitamin E activity? _____ tocopherol.
   A. Beta
   B. Gamma
   C. Delta
   D. Alpha

SECTION B: ANSWER *ALL* QUESTIONS, EACH QUESTION, 5 MARKS (30 MARKS)

11. Differentiate between
   i. Water activity and moisture content [2 marks]
   ii. Amylose and amylopectin [2 marks]
   iii. Essential amino acid and conditionally essential amino acid [2 marks]
12.
   i. Consider a food material with a dry basis moisture content of 8.09 grams of water per gram of dry solids. What is its wet basis moisture content? [3 marks]
   ii. A processor has 890 kg of mangoes with a moisture content of 85% on a wet basis. Calculate the weight of water and solids present. [3 marks]
13. Highlight **SIX** functions of proteins in food. [3 marks]
14.
   i. Define food additives. [1 marks]
   ii. List **FIVE** classifications of food additives giving one example of each. [5 marks]
15. Outline **SIX** uses of lipids in food. [6 marks]

SECTION C: ANSWER ***ANY TWO*** QUESTIONS; EACH QUESTION 15 MARKS (30 MARKS)

15. Discuss the following:-
   a) **THREE** reactions of carbohydrates. [9 marks]
   b) **THREE** uses of unmodified starch in foods. [3 marks]
   c) **THREE** uses of modified starch in foods. [3 marks]
16. Discuss **FIVE** ways of reducing saturated fatty acid composition of lipids. [15 marks]
17. Discuss uses of enzymes in the following food industries;
   a)Brewing [4 marks]
   b)Baking [4 marks]
   c)Dairy [3 marks]
   d)Animal Feed [2 marks]
   e)Meat and fish [2 marks]