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QUALIFICATION : <b>BACHELOR OF HUMAN NUTRITION</b>	
QUALIFICATION CODE: <b>08BOHN</b>	LEVEL: <b>6</b>
COURSE: <b>FOOD CHEMISTRY</b>	COURSE CODE: <b>FCH621S</b>
DATE: <b>NOVEMBER 2023</b>	SESSION: <b>1</b>
DURATION: <b>3 HOURS</b>	MARKS: <b>100</b>

#### **FIRST OPPORTUNITY: EXAMINATION QUESTION PAPER**

**EXAMINER: MR. ERICK NATANGWE UUKULE**

**MODERATOR: MS. FIINA K. NAMUKWAMBI**

#### **INSTRUCTIONS:**

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

#### **PERMISSIBLE MATERIALS:**

1. None

#### **ATTACHMENTS**

1. None

**This question paper consists of 5 pages including this front page**

**QUESTION 1: MULTIPLE CHOICE QUESTIONS****[10 MARKS]**

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase on your ANSWER SHEET.

[10]

- 1.1 The chemical bond formed between two monosaccharides is called:
- A. Glycosidic bond.
  - B. Glycolipid bond.
  - C. Peptide bond.
  - D. Glycophospholipid bond.
- 1.2 Which of the following classes of enzymes are popular in the food industry:
- A. Hydrolyses and oxidoreductases.
  - B. Transferases and Lyases.
  - C. Isomerases and Ligases.
  - D. All of the above.
- 1.3 Which of the following enzymes is widely used in brewing industry:
- A. Protease
  - B. Lactase
  - C. Amylase
  - D. Pectinase
- 1.4 Which of the following types of starch contributes to gel formation:
- A. Amylopectin
  - B. Amylose
  - C. Pectin and amylose
  - D. None of the above
- 1.5 Which of the following lipids is non-polar:
- A. Glycolipid.
  - B. Lipoprotein.
  - C. Phospholipid.
  - D. Triacylglycerol.
- 1.6 Which of the following haem compounds is responsible for meat's red colour:
- A. Oxy-myoglobin.
  - B. Myoglobin.
  - C. Met-myoglobin.
  - D. All of the above.

- 1.7 Which of the following is not a chlorophyll preservation method:
- A. Acid neutralisation.
  - B. High Temperature Short Time (HTST) processing.
  - C. Allomerisation.
  - D. Application of Metallo Complex.
- 1.8 Goitre is a deficiency disease caused by a lack of which of the following minerals:
- A. Iodine.
  - B. Iron.
  - C. Selenium.
  - D. Zinc.
- 1.9 Lactose in milk is a:
- A. Polysaccharide.
  - B. Oligosaccharide.
  - C. Monosaccharide
  - D. Disaccharide
- 1.10 Which of the following processes alters the melting point of lipids without changing their fatty acid composition.
- A. Hydrogenation.
  - B. Interesterification.
  - C. Lipolysis.
  - D. Carboxylation.

**QUESTION 2: TRUE/FALSE QUESTIONS**

**[10 MARKS]**

Evaluate the statements and select whether the statement is true or false. Write the word 'True' or 'False' next to the corresponding number on your ANSWER SHEET.

- 2.1 Saturated fatty acid are more prone to lipid oxidation.
- 2.2 In basic media, chlorophyll is very stable towards heat, whereas in acidic media it is unstable.
- 2.3 Cellulose can be digested in the human body because the f-linkages can be broken down by digestive enzymes.
- 2.4 Physically entrapped water may result in a food product that has a high water activity.
- 2.5 Peptide, Ester and Glyosidic bonds are all formed via hydrolysis reactions.
- 2.6 Anthocyanins are the least distributed pigment group in the plant world.
- 2.7 Sodium is highly bioavailable compared to iron.
- 2.8 High moisture content always translates to high water activity.

- 2.9 High density lipoproteins are the desired form of cholesterol.  
2.10 Foods of plant origin are known to have high cholesterol levels.

**SECTION B: SHORT/LONG ANSWER QUESTIONS**

**[80 MARKS]**

Please answer ALL of the questions in this section.

**QUESTION 3**

**(30 MARKS)**

- 3.1 Define the following terms:
- a) Water holding capacity. (3)
  - b) Food fortification (2)
  - c) Food enrichment (1)
  - d) Food additives (3)
  - e) Nutrients bioavailability (2)
- 3.2 Outline the three things that characterise an enzyme. (3)
- 3.3 Outline any three (3) roles of water in food systems. (3)
- 3.4 State any three (3) major forces that stabilise protein structures. (4)
- 3.5 Clearly state the difference between globular and fibrous proteins. (6)
- 3.6 Mention any three (3) factors that can lead to lipid oxidation. (3)

**QUESTION 4**

**(25 MARKS)**

- 4.1 List the four main goals of food processing. (4)
- 4.2 Discuss any two factors that influence the rate at which an enzyme works. (4)
- 4.3 What is the *isoelectric point* and how does it affect protein solubility? (4)
- 4.4 Briefly discuss how the green discolouration of deoxy-myoglobin takes place. (4)
- 4.5 Based on their structure, carotenoids are divided into two groups. Mention these two groups and clearly state the difference between them. (3)
- 4.6 Outline any three biological functions of vitamins. (3)
- 4.7 Briefly explain why monosaccharides are sometimes referred to as simple sugars? (1)
- 4.8 What is the difference between an aldehyde (Aldose) and a ketone (Ketose)? (2)

**QUESTION 5****(25 MARKS)**

- 5.1 Describe the mechanisms of enzyme catalysis (5)
- 5.2 What are the three micro-nutrients with the most common deficiencies? (3)
- 5.3 State the main purposes of the Codex Alimentarius Commission. (3)
- 5.4 What is acrylamide and how does it form in foods? (3)
- 5.5 Outline any four (4) strategies used to minimise the formation of acrylamide in food. (4)
- 5.6 Select one mineral from the following list (*Calcium, iron, magnesium or Iodine*) and outline the following:
- a) Three functions. (3)
  - b) Two sources. (2)
  - c) Deficiency effects. (1)
  - d) Toxicity. (1)

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**END OF QUESTION PAPER**