

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN NURSING

NURS 113: MEDICAL BIOCHEMISTRY I

STREAMS: BSC (NURS)

TIME: 2 HOURS

DAY/DATE: TUESDAY 03/12/2019

8.30 AM – 10.30 AM

INSTRUCTIONS:

SECTION ONE (Answer ALL QUESTIONS)

1.

- i. The general formula of monosaccharides is
 (A) $C_nH_{2n}O_n$ (B) $C_{2n}H_2O_n$
 (C) $C_nH_2O_{2n}$ (D) $C_nH_{2n}O_{2n}$
- ii. Sucrose consists of
 (A) Glucose + glucose (B) Glucose + fructose
 (C) Glucose + galactose (D) Glucose + mannose
- iii. The sugar found in DNA is
 (A) Xylose (B) Ribose (C) Deoxyribose (D) Ribulose
- iv. The sugar found in RNA is
 (A) Ribose (B) Deoxyribose (C) Ribulose (D) Erythrose
- v. Obesity increases the risk of
 (A) Hypertension (B) Diabetes mellitus
 (C) Cardiovascular disease (D) All of these
- vi. An aromatic amino acid is
 (A) Lysine (B) Tyrosine (C) Taurine (D) Arginine
- vii. An essential amino acid in man is
 (A) Aspartate (B) Tyrosine (C) Methionine (D) Serine

- viii. Non-essential amino acids
 (A) Are not components of tissue proteins
 (B) May be synthesized in the body from essential amino acids
 (C) Have no role in the metabolism
 (D) May be synthesized in the body in diseased states
- ix. The α -helix of proteins is
 (A) A pleated structure
 (B) Made periodic by disulphide bridges
 (C) A non-periodic structure
 (D) Stabilised by hydrogen bonds between NH and CO groups of the main chain
- x. Primary structure of a protein is formed by
 (A) Hydrogen bonds (B) Peptide bonds
 (C) Disulphide bonds (D) All of these
- xi. Molecular formula of cholesterol is
 (A) $C_{27}H_{45}OH$ (B) $C_{29}H_{47}OH$
 (C) $C_{29}H_{47}OH$ (D) $C_{23}H_{41}OH$
- xii. Biological functions of lipids include
 (A) Source of energy (B) Insulating material
 (C) Maintenance of cellular integrity (D) All the above
- xiii. A Holoenzyme is
 (A) Functional unit (B) Apo enzyme
 (C) Coenzyme (D) All the above
- xiv. The enzyme which can add water to a carbon-carbon double bond or remove water to create a double bond without breaking the bond is
 (A) Hydratase (B) Hydroxylase
 (C) Hydrolase (D) Esterase
- xv. Fischer's 'lock and key' model of the enzyme action implies that
 (A) The active site is complementary in shape to that of substance only after interaction.
 (B) The active site is complementary in shape to that of substance
 (C) Substrates change conformation prior to active site interaction
 (D) The active site is flexible and adjusts to substrate
- xvi. The pH optima of most of the enzymes is
 (A) Between 2 and 4 (B) Between 5 and 9
 (C) Between 8 and 12 (D) Above 12
- xvii. Factors affecting enzyme activity:
 (A) Concentration (B) pH

- (C) Temperature (D) All the above
- xviii. One of the enzymes regulating glycolysis is
 (A) Phosphofructokinase
 (B) Glyceraldehyde-3-phosphate dehydrogenase
 (C) Phosphotrioseisomerase
 (D) Phosphohexoseisomerase
- xix. Coenzyme is
 (A) Often a vitamin (B) Always an inorganic compound
 (C) Always a protein (D) Often a metal
- xx. The total body water in various subjects is relatively constant when expressed as percentage of the lean body mass and is about
 (A). 30% (B) 40% (C) 50% (D) 70%

SECTION TWO (Answer ALL QUESTIONS) TOTAL 20 MARKS

- i. State four functions of lipids in the body. (4 marks)
- ii. Define (6 marks)
 a. Gluconeogenesis
 b. Co-enzyme
 c. Glycolysis
- iii. State chemical elements that make up the majority of living biological matter (4 marks)
- iv. Explain the following equation in enzyme kinetics: $E+S \rightarrow ES \rightarrow E + P$ (5 marks)
- v. Draw the structure of fructose. (3 marks)
- vi. List three unique properties of water. (3 marks)
- vii. List the classification of amino acids based on their side chain structure (structural composition). (5 marks)

SECTION THREE (Answer ONLY ONE QUESTION) TOTAL 30 MARKS

QUESTION THREE (20 MARKS)

3. Discuss the steps involved in Glycolysis pathway. (20 marks)

QUESTION FOUR (20 MARKS)

4. The cell is the basic unit of life. Sketch a human cell and describe the importance of the main components and organelles of the cell you have sketched. (20 marks)

