



(University of Choice)

**MASINDEMULIROUNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)
MAIN CAMPUS
UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
MAIN EXAM
FIRST YEAR SECOND SEMESTER EXAMINATIONS
FOR
DIPLOMA OF MEDICAL BIOTECHNOLOGY**

COURSE CODE BBD 125

COURSE TITLE: GENERAL ORGANIC CHEMISTRY AND ANALYSIS

DATE: 25/04/2022

TIME: 8.00 -10.00 AM

INSTRUCTIONS TO CANDIDATES

- This paper is divided into three sections, **A B** and **C**, carrying respectively: Multiple Choice Questions (**MCQs**), Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**).
- Answer all questions.
- Write your answers on the provided university examination booklet.

TIME: 2 Hours

SECTION A (MCQs) 20MARKS

- Which one of the following is NOT an hexose sugar?
 - Glucose
 - Galactose
 - Fructose
 - Glyceraldehyde
- Which one of the following is NOT a basic amino acid?
 - Histidine
 - Lysine
 - Proline
 - Arginine
- What is the metabolic reaction that leads to the production of complex structures from simpler structures?
 - Anabolism
 - Catabolism
 - Exergonic reactions
 - Endergonic reactions
- The process of protein structure disruption is known as
 - Allostery
 - Conjugation
 - Denaturation
 - Conformation
- Which one of the following is NOT a globular protein?
 - Insulin
 - Keratin
 - Myoglobin
 - Immunoglobulin
- Steroids are lipid molecules with a fused-ring system. Which one of the following is NOT a steroid?
 - Androgens
 - Ceramide
 - Estrogen
 - Progestins
- A positive test for starch using iodine results in which colour?
 - Blue
 - Red
 - Colourless
 - Orange
- What is the hydrolysis reaction between sodium hydroxide with tryacylglycerides?
 - Hydrolysis
 - Condensation
 - Glycosylation
 - Saponification
- Which of the following is a component of the secondary structure of proteins?
 - Beta pleated sheets
 - Amino acid sequence
 - 3-D structure
 - Cysteine bonds
- Which of the following compounds has carbonyl group in any of its molecules?
 - Ethanoic acid
 - Ethanone
 - Ethanal
 - All of the above
- Which of the following is not true about benzene
 - It has a pi bonds in its structure
 - It has a sigma bonds in its structure

- c) It has two resonance structures
 d) None of the above
12. The compound consisting of a methyl group attached on a benzene ring is commonly called
 a) Toluene
 b) Phenol
 c) Pyridine
 d) Xylene
13. As compared to its parent alkane, an alkyl radical contains one
 a) Less carbon
 b) Less hydrogen
 c) More carbon
 d) More hydrogen
14. Benedict's test is less likely to give weakly positive results with concentrated urine due to the action of
 (a) Urea
 (b) Uric acid
 (c) Ammonium salts
 (d) Phosphates.
15. What two sugars is lactose composed of?
 a) Glucose and fructose
 b) Glucose and sucrose
 c) Galactose and sucrose
 d) Glucose and galactose
16. What type of process is occurring as carbohydrates are broken down to carbon dioxide?
 a) Proteolysis
 b) Oxidation
 c) Substitution
 d) Reduction
17. The instrument which is used to find the relative atomic mass of each isotope in an element is called?
 a) Mass spectrometer
 b) Ionic spectrometer
 c) Atomic spectrometer
 d) Volumetric spectrometer
18. What happens to an atom of oxygen?
 a). It loses six electrons to become stable.
 b). It gains three electrons to become stable.
 c) It loses two electrons to become stable.
 d). It shares two pairs of electrons with another atom to become stable.
19. Which one of the following violates the octet rule?
 a) PCl_3
 b) CBr_4
 c) NF_3
 d) AsF_5
20. Which of the following pairs of elements and valence electrons is incorrect?
 a) Al - 3
 b) Br - 7
 c) S - 4
 d) Sr - 2

SECTION B (40MKS)

- Discuss eight types of proteins (8marks)
- Define the following (8mks)
 - Conjugate acid base pair

- (b) Bronsted Lowry theory
 - (c) Ph.
 - (d) Ph. equation
3. Discuss the following
- (a) Fibrous protein (4mks)
 - (b) Globular protein (4mks)
4. Discuss chirality (8mks)
5. Define the following ; (8 mks)
- (a) Isomers
 - (b) Enantiomers
 - (c) Diastereomers
 - (d) Rotamers

SECTION C

1. Describe the four levels of organization of the protein structure. (20 mks)
2. Giving examples and their structures, discuss four types amino acids (20mks)
3. Discuss metabolism of the following ; (20 mks)
 - (a) Lipids
 - (c) Carbohydrates
 - (c) Proteins and amino acids
 - (d) Nucleotides