



# Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL  
LABORATORY SCIENCES

**AML 4202: BASIC METABOLISM**

SPECIAL/SUPPLEMENTARY EXAMINATION

FEBRUARY 2013 SERIES

2 HOURS

Instructions to candidates:

This paper consist of **TWO** sections **A** and **B**

**Section A** –Contains MCQS, any wrong response will be penalised. Answer **ALL** questions in **Section B**.

**SECTION A – MCQs – (30marks)**

1. Which of the following is true
  - a) A non-competitive inhibitor molecule is different in structure from the substrate
  - b) A competitive inhibitor molecule is different in structure from the substrate
  - c) A competitive inhibitor molecule has a structure similar to the substrate molecule
  - d) None of the above
  
2. What is the ratio of carbon to hydrogen molecules in a carbohydrate?
  - a) 1:1
  - b) 1:2
  - c) 2:1
  - d) 3:1

3. The name of the process by which glycogen is broken to glucose
  - a) Hydrolysis
  - b) Translation
  - c) Respiration
  - d) Dehydration
  
4. Which of the following is composed of nucleotides ?
  - a) FATS
  - b) RNA
  - c) STARCH
  - d) PROTEIN
  
5. Which of the following lists the pyrimidine nucleotides ?
  - a) Adenine and cytosine
  - b) Guanine and thymine
  - c) Cytosine and thymine
  - d) Adenine and thymine
  
6. Which of the following is true ?
  - a) Lipids do not form polymers
  - b) Lipids form polymers
  - c) Carbohydrates do not form polymers
  - d) None of the above

7. Which of the following is false
- a) Hydrolysis is a catabolic process
  - b) Hydrolysis is an anabolic process
  - c) Dehydration is an anabolic process
  - d) Dehydration a catabolic process
8. Which of the following is true
- a) Enzymes increase the reaction energy of reactants in a reaction
  - b) Enzymes lower the actuation energy of products in a chemical reaction
  - c) Enzymes increase the actuation energy of products in a chemical reaction
  - d) Enzymes lower the actuation energy of reactants in a chemical reaction
9. The lock and key model of enzymes as from illustrates that a particular enzyme molecule
- a) Forms a permanent enzymes –substrate complex.
  - b) May be destroyed and resynthesized
  - c) Interacts with a specific types of substrate molecule
  - d) Reacts at identical rates under all conditions
10. An enzyme that hydrolyses protein will not act upon starch. This fact is an indication that enzymes are
- a) Hydrolytic
  - b) Specific
  - c) Catalytic
  - d) Synthetic

11. At high temperature the rate of enzyme action decreases because the increased heat
- Changes the pH of the system
  - Alters the active site of the enzyme
  - Neutralizes acids and bases in the system
  - Increases the concentration of enzymes
12. Which one is not an attribute of an enzyme
- Specific in nature
  - Protein in chemistry
  - Required in large amounts
  - Increases rate of reaction
13. \_\_\_\_\_ occurs when the inhibitory chemical , which resembles the substrate binds to the enzyme at the active site
- Non-competitive inhibition
  - Competitive inhibition
  - Uncatalysed reaction
  - All a, b and c
14. If an enzyme solution is saturated with substrate, the most effective way to obtain an even faster yield of products would be
- Add more of the enzyme
  - Add more substrate
  - Add an allosteric inhibitor
  - Add a non-competitive inhibitor

15. Which of the following are pyrimidines in RNA?

- a) Adenine
- b) Uracil
- c) Guanine
- d) Thymine

16. Which of the following molecules are produced in pentose phosphate pathway

- a) NADPH
- b) Glucose
- c) Pyruvate
- d) Hexokinase

17. Glucose

- a) Is the molecule that start the glycolytic pathway
- b) Is a three carbon molecule
- c) In the end product of the citric acid cycle
- d) Does not occur in animal cells

18. Pyruvate

- a) Is the molecule that starts the citric acid cycle
- b) Is the end product of oxidative phosphorylation
- c) Is a six-carbon molecule
- d) Forms at the end of glycolysis

19. The end products of the citric acid cycle include all of the following except

- a)  $\text{CO}_2$
- b) Pyruvic acid
- c)  $\text{FADH}_2$
- d) ATP

20. Which of the following is an example of denaturation?
- a) Evaporation of sweat on skin surface
  - b) Formation of micelles
  - c) Enzymes losing function when heated
  - d) Hydrogenation of oils
21. The bonding of unit molecules to produce a polysaccharide is called
- a) Hydrolysis
  - b) Translation
  - c) Cellular respiration
  - d) Dehydration
22. Which of the following is /are made up of amino acid molecules?
- a) Adipose tissue
  - b) Oxidoreductases
  - c) Glycogen
  - d) None of the above
23. An unsaturated fat could be changed into a saturated fat is
- a) Peptide bonds were added
  - b) Hydrogen atoms were added
  - c) Glycerol molecules were added
  - d) Fatty acid chains were shortened
24. The following bonds are found in proteins
- a) Peptide bonds
  - b) Ester bonds
  - c) Glycosidic bonds
  - d) None of the above

25. Which of the following is the monomer of RNA?
- a) Triglyceride
  - b) Deoxyribonucleotide
  - c) Ribonucleotide
  - d) Deoxyribonucleotide
26. Which of the following represents the structure of a nucleoside?
- a) Salt-lipid-base
  - b) Glucose-glucose-glucose
  - c) Phosphate-sugar-nitrogen base
  - d) Sugar-nitrogen base
27. The bonding of three amino acids would result into an
- a) Triglyceride
  - b) Polypeptide
  - c) Phospholipid
  - d) Polysaccharide
28. Creatinuria occurs in
- a) Gout
  - b) Diabetes insipidus
  - c) Diabetes mellitus
  - d) Prolonged starvation

**SECTION B – (40marks) Answer ALL questions**

1. Describe the following factors affecting enzyme activity
  - a) Temperature **(5marks)**
  - b) Concentration of enzyme **(5marks)**
2. Describe enzyme inhibition **(10marks)**
3. Describe the pay off phase of the glycolytic pathway **(10marks)**
4. Describe the induced fit mechanism of enzyme action **(10marks)**