



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2018 TRIMESTER

FACULTY OF SCIENCES

DEPARTMENT OF COMMUNITY HEALTH

REGULAR PROGRAMME

HBMS 104: BIOCHEMISTRY

Date: APRIL 2018

Duration: 2 Hours

INSTRUCTIONS: Answer ALL Questions

- Q1. Two polypeptide chains of insulin are linked together by
- Hydrogen bond
 - Disulphide bond
 - Ester bond
 - Peptide bond
- Q2. Milk sugar is known as
- Fructose
 - Glucose
 - Sucrose
 - Lactose
- Q3. The sites for gluconeogenesis are
- Liver and kidney
 - Skin and pancreas
 - Lung and brain
 - Intestine and lens of eye
- Q4. An enzyme involved in gluconeogenesis is
- Pyruvate kinase
 - Pyruvate carboxylase
 - Hexokinase
 - Phosphohexose isomerase

- Q5. The enzyme glucose 6-phosphatase is present in
- Liver
 - Muscle
 - Adipose tissue
 - Brain
- Q6. Ketosis reflects
- Increased hepatic glucose liberation
 - Increased fatty acid oxidation
 - Increased carbohydrate utilisation
 - Increased gluconeogenesis
- Q7. Ketosis is associated with the disease:
- Nephritis
 - Diabetes mellitus
 - Edema
 - Coronary artery diseases
- Q8. Glucose-6-phosphate dehydrogenase is induced by
- 6-Phosphogluconolactone
 - Glucose-6-phosphate
 - Ribose-5-phosphate
 - Insulin
- Q9. Complete oxidation of one molecule of glucose into CO₂ and H₂O yields
- 8 ATP equivalents
 - 15 ATP equivalents
 - 30 ATP equivalents
 - 38 ATP equivalents
- Q10. A unique by-product of glycolysis in erythrocytes is
- Lactate
 - 1, 3-Biphosphoglycerate
 - 2, 3-Biphosphoglycerate
 - All of these
- Q11. Which of the following enzymes incorporates inorganic phosphate into the substrate?
- Phosphoglycerate kinase
 - Glyceraldehyde-3-phosphate dehydrogenase
 - Pyruvate kinase
 - Enolase
- Q12. A substrate for the enzyme aldolase is
- galactose-6-phosphate
 - isocitric acid

- c) Glucose-1-phosphate
 - d) Fructose 1, 6 diphosphate
- Q13. Pyruvate dehydrogenase is a/an
- a) Isomerase
 - b) Lyase
 - c) Ligase
 - d) Oxido reductase
- Q14. An enzyme is a
- a) Carbohydrate
 - b) Lipid
 - c) Protein
 - d) Nucleic acid
- Q15. Denaturation of proteins results in
- a) Disruption of primary structure
 - b) Breakdown of peptide bonds
 - c) Destruction of hydrogen bonds
 - d) Irreversible changes in the molecule
- Q16. Tertiary structure of a protein describes
- a) The order of amino acids
 - b) Location of disulphide bonds
 - c) Loop regions of proteins
 - d) The ways of protein folding
- Q17. An essential amino acid in man is
- a) Aspartate
 - b) Tyrosine
 - c) Methionine
 - d) Serine
- Q18. 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
- Q19. An example of polar amino acid is
- a) Alanine
 - b) Leucine
 - c) Arginine
 - d) Valine

Q20. The amino acid with a nonpolar side chain is

- a) Serine
- b) Valine
- c) Asparagine
- d) Threonine

PART-II: SHORT ANSWER QUESTIONS (SAQs)

40 MARKS

Q1. Define the following terms, and give an appropriate examples (1 mark each)

- a) Biomolecules
- b) polymer
- c) Anabolism
- d) Catabolism
- e) Gluconeogenesis

Q2. Outline 5 functions of carbohydrate in living organism **(5 marks)**

Q3. Outline the 3 roles of catabolism giving appropriate example **(6 marks)**

Q4. Using a flow chart outline the priming phase of glycolysis **(9 marks)**

Q5. Outline glucose metabolism in the liver **(6 marks)**

Q6. Outline 3 glycogen storage diseases **(9 marks)**

PART III: LONG ANSWER QUESTIONS (LAQs)

40 MARKS

Q1. Discuss Pentose Phosphate Pathway under the following topics (20 marks)

a) Functions of pentose phosphate pathways **(3 marks)**

b) Reaction of pentose phosphate pathways **(12 marks)**

c) Clinical conditions associated with deficiencies of enzymes involved in pentose phosphate pathway **(5 marks)**

Q2. Discuss the citric acid cycle (Kreb cycle) **(20 marks)**

END