CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATION

RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (NURSING)

NURS 116: MEDICAL BIOCHEMISTRY II

STREAMS: BSc. Nursing **TIME: 2 HOURS**

DAY/DATE: THURSDAY 06/05/2021 **8.30 A.M - 10.30 A.M.**

INSTRUCTIONS

- All questions are compulsory. Ensure that all your answers are properly numbered.
- Part I: Multiple Choice Questions (MCQ): Choose the most correct answer. Each MCQ is 2 marks.
- Part II: Long Answer Questions: Answer each question on the answer booklet.

PART I: MULTIPLE CHOICE QUESTIONS (30 MARKS)

1. Ketosis is partly ascribed to:

a. Over production of glucose

b. Under production of glucose

c. Increased carbohydrate utilisation

d. Increased fat utilisation

e. Increased pyruvate in liver

2. Which of the following amino acids on degradation produces a glucogenic intermediate of TCA cycle and ketone body?

a. Glycine

b. Serine

c. Alanine

d. Cysteine

e. Phenylalanine

3. All of the following compounds are intermediates of TCA cycle except:

a. Malate

b. Pyruvate

c. Oxaloacetate

d. Fumarate

e. Succinate

4. The rate limiting step in cholesterol biosynthesis is:

a. Squalenesynthetase

b. Mevalonate kinase

c. HMG-CoA synthetase

d. HMG-CoA reductase

e. Thiolase

5. In conversion of lactic acid to glucose, three reactions of glycolytic pathway are circumvented, which of the following enzymes do not participate?

a. Pyruvate carboxylase

b. Phosphoenolpyruvatecarboxykinase

c. Pyruvate kinase

d. Glucose-6-phosphatase

e. Fructose-1, 6-biphosphatase

6. MacArdle's disease involves a deficiency of which enzyme?

a. Acid maltase

b. Glucose-6-phosphatase

c. Hepatic phosphorylase

d. Muscle phosphorylase

e. Branching enzyme

7. Phenylketonuria is an inherited disorder due to deficiency of the enzyme:

a. Transaminase

b. Homogentisate oxidase

c. Phenylalanine hydroxylase

d. Isomerase

e. None of the above

8. In Rapaport-Leubering shunt in erythrocytes, 2,3-biphosphoglycerate (2,3-BPG) is produced from which intermediate in glycolytic pathway?

a. 3-phosphoglycerate

b. 2-phosphoglycerate

c. 1,3-biphosphoglycerate

d. Glyceraldehyde-3-P

e. Dihydoxyacetone-P

9. A pathway that requires NADPH as a cofactor is:

a. Fatty acid oxidation

b. Extramitochondrial*de novo* fatty acid synthesis

c. Ketone bodies formation

d. Glycogenesis

e. Gluconeogenesis

10. Depletion of α-ketoglutarate during increased NH_3 influxleads to the formation of:

a. Glutamine

b. Proline

c. Arginine

d. Histamine

e. Serine

11. Which of the following is a substrate for aldolase activity in glycolytic pathway?

a. Glyceraldehyde-3-P

b. Glucose-6-P

c. Fructose-6-P

d. 1,3-diphosphoglycerate

e. Fructose-1,6-bi-P

12. β-oxidation of odd-carbon fatty acid chain produces:

a. Succinyl-CoA

b. Propionyl-CoA

c. acetyl-CoA

d. Malonyl-CoA

e. acetoacetyl-CoA

13. All of the following tissues are capable of using ketonebodies, except:

a. Brain

b. Renal cortex

c. Red blood cells

d. Cardiac muscle

e. Skeletal muscle

14. Quantitatively the most important enzyme involved information of NH_3 from amino acids in humans is:

a. L-amino acid oxidase

b. Serine dehydratase

c. Glutamate dehydrogenase

d. Histidase

e. Desulfhydrase

15. A liver biopsy from an infant with hepatomegaly, stunted growth, hypoglycaemia, lactic acidosis, hyperlipidaemiarevealed accumulation of glycogen having normal structure**.** A possible diagnosis would be:

a. Branching enzyme deficiency

b. Acid maltase deficiency

c. Liver phosphorylase deficiency

d. Debranching enzyme deficiency

e. Glucose-6-phosphatase deficiency

PART II: LONG ANSWER QUESTIONS (50 MARKS)

1. Corona virus Disease of 2019 (Covid-19) has posed a serious threat to the global public health, with daily mortality and morbidity increasing exponentially. Discuss Covid-19 under the following headings:
   (a) Metabolic complications in affected tissues/organs
   (b) Preventive measures
   (c) "Silent spreaders"
   (d) Variant strains of covid-19 (20 marks)
2. What is gluconeogenesis? Give an outline of reactions involved. List biological significance of this pathway? (15marks)

3. Discuss purine nucleotide catabolism and its clinical relevance. (15 marks)

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