

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION  
RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS  
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE**

**NURU 119/ NURS 116: BIOCHEMISTRY II**

**STREAMS:**

**TIME: 2 HOURS**

**DAY/DATE: WENESDAY 03/11/2021**

**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): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark.
- Part II: Short Answer Questions-Answer questions following each other on the answer booklet.
- Part III: Long Answer Questions: Answer each question on the answer booklet.

**PART I: MCQ (20 MARKS)**

1. 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

2.  $\beta$ -oxidation of odd-carbon fatty acid chain produces:

- a). Succinyl-CoA
- b). Propionyl-CoA

- c). acetyl-CoA
- d). Malonyl-CoA

3. Untreated diabetes mellitus may result in all of the following except:

- a. Blindness
- b). Cardiovascular disease
- c). Tinnitus
- d). lower limb amputation

4. Tryptophan is best described by which of the following statement?

- a). It produces thyroid hormones
- b). Is a precursor for melanin
- c). It is a precursor of the pineal hormone melatonin
- d). It produces catecholamine

5. In haem catabolism, the first bile pigment formed is:

- a). Cholic acid
- b). Bilirubin
- c). Lithocholic acid
- d). Biliverdin

6. Key regulatory enzyme of urea cycle is?

- a) Ornithine transcarbamoylase
- b) Carbamoyl phosphate synthetase-I
- c) Keto acyl synthetase
- d) Arginase.

7. A 50 years-old man has been fasting for religious reason for several days. His brain has reduced its need for glucose by using which of the following substances as an alternate source of energy?

- a) Fatty acids

- b) Acetyl CoA
- c) Glycerol
- d)  $\beta$ -hydroxybutyrate

8. Chronic alcohol abuse may manifest itself in the following forms except

- a) Ketoacidosis
- b) Lipolysis
- c) Hepatitis
- d) Gout

9. Which one of the following enzymes of nucleotide metabolism is correctly paired with its pharmacological inhibitor?

- a) Dihydrofolate reductase—methotrexate
- b) IMP dehydrogenase—hydroxyurea
- c) Ribonucleotide reductase—5-fluorouracil
- d) Thymidylate synthase—allopurinol

10. A common intermediate in the conversion of glycerol and lactate to glucose is which of the following?

- a) Pyruvate
- b) Oxaloacetate
- c) Glucose 6-phosphate
- d) Phosphoenolpyruvate

11. Which one of the following sequences places the lipoproteins in the order of most dense to least dense?

- a) HDL/VLDL/chylomicrons/LDL
- b) HDL/LDL/VLDL/chylomicrons
- c) LDL/chylomicrons/HDL/VLDL
- d) VLDL/chylomicrons/LDL/HDL

12. Pyridoxal phosphate, which is required for transamination, is also required for which of the following

pathways?

- a) Glycolysis
- b) Glycogenolysis
- c) TCA cycle
- d) Fatty acid oxidation

13. Glucagon and epinephrine stimulate glycogen breakdown to glucose 6-phosphate

- a) Directly by binding to glycogen phosphorylase
- b) Indirectly by first stimulating adenylate cyclase to make cAMP
- c) Only in the liver
- d) Only in muscle cell

14. The first step in the synthesis of fatty acids is catalyzed by

- a) HMG-CoA reductase
- b) Acetyl-CoA carboxylase
- c)  $\beta$ -hydroxyacyl-ACP dehydratase
- d) Acyl co-A dehydrogenase

15. Which of the following enzyme is not involved in gluconeogenesis?

- a) Hexokinase
- b) Glucose- 6-phosphatase
- c) PEP Carboxykinase
- d) Pyruvate carboxylase

16. The main function of pentose phosphate pathway is to;

- a) Give the cell an alternate pathway should glycolysis fail
- b) Supply pentose and NADPH
- c) Supply energy
- d) Provide mechanism for utilization of the carbon skeletons of excess amino acids

17. A 42-year-old male patient undergoing radiation therapy for prostate cancer develops severe pain in the metatarsal phalangeal joint of his right big toe. Monosodium urate crystals are detected by polarized light microscopy in fluid obtained from this joint by arthrocentesis. Uric acid crystals are present in his urine. This patient's pain is directly caused by the overproduction of the end product of which of the following metabolic pathways?

- a) Purine degradation
- b) Pyrimidine degradation.
- c) De novo purine biosynthesis.
- d) Purine salvage.

18. A patient has large deposit of liver glycogen, which after an overnight fast had shorter than normal branches. This abnormality could be caused by a defective form of which of the following proteins?

- a) Amylo 1,6 glucosidase
- b) Amylo 4,6 transferase
- c) Glycogen phosphorylase
- d) Glycogenin

19. A person with phenylketonuria cannot convert

- a) phenylalanine to tyrosine
- b) phenylalanine to isoleucine
- c) phenylalanine to lysine
- d) phenol to ketones

20. Medium-chain fatty acids are given because they:

- a) stimulates VLDL production by the liver.
  - b) enter directly into the portal blood, and can be metabolized by the liver.
  - c) are activators of lipoprotein lipase.
  - d) are more efficiently packed into serum lipoproteins.
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