KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (MEDICAL LABORATORY)

HML104: BASIC BIOCHEMISTRY II

DATE: Tuesday 27th March 2012 **TIME:** 8.00a.m – 10.00a.m

INSTRUCTIONS: Section A: Answer all questions (5 marks each)

1. Indicate the site/location in the cell where the following metabolic reactions take place (5 Marks)
   i. Gluconeogenesis
   ii. Kreb cycle
   iii. Ketone biosynthesis
   iv. Hexose monophosphate shunt
   v. Embden Meyerhof pathway
2. List five enzymes involved in citric acid cycle (5 Marks)
3. (i) Desribe the fate of glycerol after lipolysis (3Marks)

   (ii) Name **TWO** Ketone body substances (2 Marks)

SECTION B Answer any ONE question (20 mks each)

4. (a) Outline the carnitine shuttle transport system for activated fatty acid from the cytosol to the mitochondria (5 Marks)

   (b)Discuss the alternative processes of overcoming the irreversible steps during gluconeogenesis (15 Marks)

5. (i) Describe the fate of pyruvate after glycolysis (8 Marks)

   (ii)Discuss the glycolytic pathway and clearly indicate the substrate levels phosphorylation (12 Marks)

SECTION C. (Answer all questions by circling the correct one ½ Mark each)

1. One of the following enzymes in glycolysis catalyzes an irreversible reaction
a) Hexokinase
b) Phosphofructokinase
c) Pyruvate kinase
d) All of them

2. The number of ATP produced when a molecule of acetyl COA is oxidized through citric acid cycle is:-
a) 12
b) 24
c) 38
d) 15

3. The connecting line between HMP shunt and lipid synthesis is:-
a) Ribose
b) NADPH
c) Sedoheptulose-7-phosphate
d) NADH

4. Hypercholesterolemia is observed in the disorder
a) Hypothyroidism
b) Diabetes mellitus
c) Nephritic sydrome
d) All of them

5. The final product in the β-oxidation of odd chain fatty acids are:-
a) Acetyl COA and malonyl COA
b) Acetyl COA and acetyl COA
c) Acetyl COA and propionyl COA
d) Acetyl COA and succinyl COA

6. Which amino acid that does not participate in transmination:-
a) Lysine
b) Glutamate
c) Alanine
d) Tryphtophan

7. Which enzymes catalyses substrate level phosphosylation:-
   a) Phosphofructokinase and Hexokinase
   b) Enolase and Thiokinase
   c) Phosphoglycerate kinase and Pyruvate kinase
   d) Malate dehyorogenase and ∝ -ketoglutarate dehydrogenase

8. Over production of Ketone bodies causes:-
a) Acidosis
b) Diabetes mellitus
c) Ketonuria
d) All the above

9. Tyrosinemia II type is caused by:-
a) Tyrosine dehydrogenase
b) Tyrosine kinase
c) Tyrosine transaminase
d) None of the above

10. Deficiency of P-deydroxyphenyl pryruvate dioxygenace causes:-
(a) Alkaptonuria
(b) Galactosemia
(c) Ketosis
(d) Neonatal tyrosinemia

11. Name the amino acid that directly participates in the synthesis of heme:-
(a) Methionine
(b) Aspartate
(c) Glycine
(d) Tryptophan

12. Orotic aciduria can be treated by diet rich in:-
a) Adenine
b) Guanine
c) Uridine
d) Try one of them

13. Name the enzymes associated with hyprerуricemia
a) PRPP synthetase
b) HGPRT
c) Glucose-6-phosphates
d) All of them

14. The end product of purine metabolism in humans is;-
a) Xanthine
b) Uric acid
c) Urea
d) Allantoin

15. The nitrogen atoms in purines ring are obtained from:-
a) Glycine
b) Glutamine
c) Aspartate
d) All of them

16. Ketogenic amino acids are:-
a) Those that synthesis glucose
b) Those that degraded to ketoacids
c) Those that synthesis lipids
d) All of the above

17. Serotonin is synthesized from.....amino acid:-
a) Glycine
b) Leuceine
c) Proline
d) Tryptophan

18. Glycine is involved in the synthesis of:-
a) Creatine
b) Heme
c) Purine
d) All above

19. The defect of phenylalanine hydroxylase causes:-
a) Phenyl acidosis
b) Phenylketonuria
c) Hyperoxaluria
d) None above

20. Which is not a anabolic process
a) Glycogenolysis
b) Gluconeogenesis
c) Glycogenesis
d) All above

21. Which enzyme catalyses is a rate limiting step in glycolysis
a) Hexokinace
b) PFKI
c) Glucokinase
d) Pyruvate kinase

22. One of the following enzymes in glycolysis catalyses an irreversible reaction
a) Hexokinase
b) PFK
c) Pyruvate kinase
d) All of them

23. NADH produces.....ATP during oxidative phosphorylation
a) 12
b) 5
c) 3
d) 2

24. Elevation lactic acidosis is caused by.....deficiency
a) Lactate dehydrogenases
b) Pyruvate dehydrogenases
c) Enolase
d) Isomerase

25. Kreb cycle is amphibolic that is:-
a) Both anabolic and catabolic
b) Both acidic and basic
c) Both positive and negative charged
d) None of the above

26. The net ATP produced during glycolysis is
a) 4
b) 1
c) 3
d) 2

27. Substrate level phosphorylation means:-
a) Substrate is degraded to give water.
b) Substrate donates a phosphate molecule to generate ATP
c) Substrate is used up for anabolism
d) None of the above

28. Identify the correct order of β- oxidation of fatty acids
a) Oxidation – Cleavage – Hydration – Oxidation
b) Oxidation – Oxidation – Hydration – Cleavage
c) Oxidation – Cleavage – Oxidation – Hydration
d) Oxidation – Hydration – Oxidation – Cleavage

29. What is the end product of odd fatty acid chain during β –oxidation

a) Pyruvate and acetyl CoA
b) Proprionate and acetyl CoA
c) Acetyl and acetyl CoA
d) All of them

30. When glucose is not synthesized from lactate produced from muscle and liver the blood pH is lower. This condition is known as:

a) Hypoglycemia
b) Lactic academia
c) Hyperlipidemia
d) Hyperunicemia