



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2019/2020
SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF
PHARMACY (BPharm Level II)

HMB 230 : MEDICAL BIOCHEMISTRY V

DATE: Wednesday, 15th January 2020

TIME: 9.00 a.m. - 12.00 p.m.

INSTRUCTIONS

SECTION A: Answer all questions (One Mark Each, Total 40 Marks)

1. Pantothenic acid is a constituent of the coenzyme involved in
 - A. Decarboxylation
 - B. Dehydrogenation
 - C. Acetylation
 - D. Oxidation
2. A cofactor required in oxidative decarboxylation of pyruvate is
 - A. Lipoate
 - B. Pantothenic acid
 - C. Biotin
 - D. Para aminobenzoic acid
3. Folic acid and methyl cobalamin (vitamin B12) are required in
 - A. Deamination of serine
 - B. Deamination of threonine
 - C. Conversion of pyridoxal phosphate to pyridoxamine phosphate
 - D. Methylation of homocystein to methionine
4. Ascorbic acid is required to synthesize all of the following. Except?
 - A. Collagen
 - B. Bile acids
 - C. Bile pigments
 - D. Epinephrine

5. Nyctalopia is.....
 - A. Drying of eyes
 - B. Destruction of cornea
 - C. Blindness
 - D. Inability to see in dimlight
6. Intestinal bacteria can synthesise
 - A. Phyllogquinone
 - B. Farnoquinone
 - C. Both (A) and (B)
 - D. Menadione
7. Vitamin E protects the polyunsaturated fatty acids from oxidation by molecular oxygen in the formation of
 - A. Superoxide
 - B. Peroxide
 - C. Trioxide
 - D. All of these
8. Sulpha drugs are antimetabolites of.....
 - A. Vitamin K
 - B. Pyridoxin
 - C. Folic acid
 - D. Vitamin B2
9. What is the disease caused by thiamine deficiency?
 - A. Nyctalopia
 - B. Scurvy
 - C. Rickets
 - D. Beriberi
10. In beri beri there will be accumulation of..... in blood.
 - A. Aceto acetic acid
 - B. α -hydroxy butyric acid
 - C. Pyruvic acid
 - D. Methyl malonic acid

11. A 2 year old boy has been diagnosed with zellweger syndrome, a disorder caused by malfunction of peroxisomes. The oxidation of which of the following fatty acid is impaired in this defect?
- A. Palmitic Acid
 - B. Unsaturated Fatty Acid
 - C. Very Long Chain Fatty Acid
 - D. Branched Hail Fatty acids
12. Which of the following statements concerning the structure of muscle tissue is correct?
- A. Skeletal muscle has the same structure as cardiac muscle
 - B. Smooth muscle cells have no striations as they lack myosin filaments
 - C. Smooth muscle has a system of T-tubules.
 - D. The myofibrils of skeletal muscle are surrounded by the sarcoplasmic reticulum.
13. Which of the following is key regulatory enzyme of fatty acid synthesis
- A. ATP Citrate Lyase
 - B. Keto Acyl Synthase
 - C. Acetyl Transacylase
 - D. Thiolase
14. Insulin increases the permeability of glucose across the plasma membrane of muscle cells by
- A. Acting on adenylate cycle
 - B. By loosening the integrity of the membrane
 - C. Through Ca^{2+} ions
 - D. By membrane cruting the hexose carries of intracellular organelles and making them fuse with the plasma membrane
15. Which of the following statements is NOT true?
- A. Tension is developed by physical bonds between thick and thin filaments.
 - B. B.Tension depends upon the degree of overlap between thick and thin filaments.
 - C. Force required to stretch the muscle at any time is unproportional to the number of cross-bridges
 - D. The cross-bridge originates at the thick filament and terminates at the thin filament

16. A medical student developed hemolytic anemia after taking the oxidizing antimalarial drug primaquine. This severe reaction is most likely due to
- A. Glucose 6 Phospahte Dehydrogenase Deficiency
 - B. Concomitant Scurvy
 - C. Diabetes
 - D. Glycogen Phosphorylase Deficiency
17. The major glycolytic product produced under normal circumstances by erythrocytes required for unloaoding of oxygen to the peripheral tissue is
- A. 2,3 Bisphosphoglycerate
 - B. 1,3 Bisphophoglycerate
 - C. Lactate
 - D. Pyruvate
18. Which of the following substrates derived from adipose tissues contributes to net gluconeogenesis in mammalian liver?
- A. Alanine
 - B. Glutamate
 - C. Glycerol
 - D. Pyruvate
19. It is very important to feed the baby very soon after birth, because during the first few hours after birth phophoenolpyruvate carboxykinase is present in very low amounts and this fact comprises:
- A. Gluconeogenesis
 - B. Glucose Phosphorylation
 - C. Glycogenolysis
 - D. Glycogenesis
20. Characterization of muscle by their power output does not depend on one of the following parameter
- A. Ferocity of contraction
 - B. Ability to Contract Repeatedly
 - C. Force of Contraction
 - D. Velocity of Contraction

21. Which of the following is effective against viral infections?
- A. IgG
 - B. IgM
 - C. Antibodies
 - D. Interferon
22. The following statements are true in relation to Entner-Doudoroff pathway except;
- A. Entner-Doudoroff pathway and Embden-Meyerhof-Parnas are similar.
 - B. The two key enzymes in Entner-Doudoroff pathway are 6-phosphogluconate dehydratase (Edd) and 2-keto-3deoxy-6-phosphogluconate adolase (Eda).
 - C. The enzymes 6-phosphogluconate dehydratase (Edd) and 2-keto-3deoxy-6-phosphogluconate adolase (Eda) have no roles in gluconate (Gnt) catabolism.
 - D. Entner-Doudoroff pathway play an important role in the survival of pathogenic bacteria.
23. Phosphoketolase is a _____ pathway.
- A. Fermentation
 - B. Glycolytic
 - C. Catabolic
 - D. Anabolic
24. Which of the following is a role of Embden Meyerhoff pathway/glycolysis in health?
- A. Has functions in glucose production and insulin secretion in the case of liver and pancreatic islets.
 - B. Glycolysis couples glycogen synthesis in the liver and muscles.
 - C. Glycolysis stimulates lipogenesis in the adipose through producing the triglyceride backbone, glycerol phosphate.
 - D. All the above.
25. The following are importance of hexose monophosphate pathway except;
- A. Production of NADPH and antioxidant defense.
 - B. Cancer therapeutics.
 - C. Malaria infection's defense.
 - D. All the above.

26. Viruses that infect bacteria are known as _____.
- A. Virusoid.
 - B. Viroids.
 - C. Bacteriophage.
 - D. Virophage.
27. Bacteria cell wall is made up of?
- A. Chitin.
 - B. Cellulose.
 - C. Peptidoglycan.
 - D. Mannose.
28. Amino acid for peptidoglycan is:
- A. D type
 - B. L type
 - C. Both D and L type
 - D. Glycine only.
29. There are two main types of lactic acid fermentation: homolactic and heterolactic. In homolactic acid fermentation
- A. Some lactate is further metabolized, resulting in ethanol and carbon dioxide via the phosphoketolase pathway.
 - B. Some lactate is further metabolized via the phosphoketolase pathway.
 - C. NADH reduces pyruvate directly to form lactate.
 - D. NAD^+ reduces pyruvate directly to form lactate.
30. In heterolactic fermentation;
- A. Some lactate is further metabolized, resulting in ethanol and carbon dioxide via the phosphoketolase pathway
 - B. Some lactate is further metabolized via the phosphoketolase pathway
 - C. NADH reduces pyruvate directly to form lactate.
 - D. NAD^+ reduces pyruvate directly to form lactate.
31. Production of serous fluid is controlled by:
- A. Capillary oncotic pressure
 - B. Capillary hydrostatic pressure
 - C. Capillary permeability
 - D. All of the above

32. Pleural fluid is collected by:
- A. Pleurocentesis
 - B. Paracentesis
 - C. Pericentesis
 - D. Thoracentesis
33. The primary cells associated with pericardial fluid include all the following except?
- A. Plasma cells
 - B. Malignant cells
 - C. Neutrophils
 - D. Basophils
34. Fluid-to-serum protein and lactic dehydrogenase ratios are performed on serous fluids:
- A. When malignancy is suspected
 - B. To classify transudates and exudates
 - C. To determine the type of serous fluid
 - D. When a traumatic tap has occurred
35. A differential observation of pleural fluid associated with tuberculosis is:
- A. Increased neutrophils
 - B. Decreased lymphocytes
 - C. Decreased mesothelial cells
 - D. Increased mesothelial cells
36. Another name for a peritoneal effusion is:
- A. Peritonitis
 - B. Lavage
 - C. Ascites
 - D. Cirrhosis
37. A high blood urea nitrogen value could mean all the following except?
- A. Severe muscle injury
 - B. Presence of urinary tract tumor
 - C. Heart failure
 - D. Bleeding in the gastrointestinal tract.

38. In samples collected for gastric function tests, the titrable acidity is likely to be affected by;
- A. Dilution and temperature
 - B. Humidity and temperature
 - C. Neutralization and dilution
 - D. Basal acid output
39. All the following radioisotopes are correctly matched with their medical use except?
- A. Technetium-99m - bone scan
 - B. Technetium-99m - gall bladder function
 - C. Technetium-99m - visualizing gastrointestinal bleeding
 - D. Phosphorus-32 - hyperthyroidism and thyroid tumors
40. Which of the following statements about water molecule is true?
- A. Both the hydrogen and oxygen atoms of the water molecule form hydrogen bonds and participate in hydration shells.
 - B. Both the hydrogen and oxygen atoms of the water molecule participate in hydration shells.
 - C. The oxygen of water can form hydrogen bonds with two other water molecules
 - D. Each water molecule is hydrogen-bonded to approximately three close neighboring water molecules in a fluid three-dimensional lattice.

SECTION B: Answer any EIGHT (8) Questions (5 Marks Each, Total 40 Marks)

1. State the biochemical role of Antixerophthalmic Factor.
2. Differentiate between water soluble vitamins and lipid soluble vitamins.
3. Explain the functions of niacin.
4. List five clinical uses of probiotics.
5. Briefly describe the L-lysine pathway in fungi metabolism.
6. Explain the mechanism of the enter-doudoroff pathway contributing to the pathogenicity of *Vibrio cholera*.
7. Describe the alternative pathways from pyruvate to Phosphoenol pyruvate.
8. Explain the metabolic significance of NADH produced during anaerobic respiration.
9. Describe the energy sources available for muscle contraction.
10. Highlight the most common causes of hyperkalemia.
11. Briefly describe the formation of the synovial fluid.
12. Using ^{131}I and ^{51}Cr radioisotopes, explain the tracer technique.

SECTION C: Answer Any FOUR Questions (10 Marks Each, Total 40 Marks)

1. Explain the functions of Antipernicious Anemia Factor.
2. Describe the biosynthesis of antiscorbutic vitamin and clinical significance.
3. Discuss the Leubering Rapaport path way and its significance.
4. Describe the absorptive state metabolic changes in liver and Kidney.
5. Discuss the mechanisms of action of a neuraminidase inhibitor and a nucleoside analogue.
6. Discuss the mechanism of gene transfer through conjugation.
7. Discuss the Biological Functions of cerebrospinal fluid.
8. Using an illustration, discuss the formation of serous fluids.