

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE
IN NURSING (UPGRADING)**

NURU 123: CLINICAL CHEMISTRY

STREAMS: NURU (Y1S1)

TIME: 2 HOURS

DAY/DATE: FRIDAY 19/12/2023

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS

1. Do not write anything on the question paper.
2. Mobile phones and any other reference materials are NOT allowed in the examination room.
3. The paper has three sections. Answer all questions.
4. Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.

Section A: Multiple Choice Questions (50 Marks)

1. Select the lipoprotein fraction that carries most of the endogenous triglycerides
 - a) VLDL
 - b) LDL
 - c) HDL
 - d) Chylomicrons
2. To produce reliable results, when should blood specimens for lipid results be drawn:
 - a) Any time during the day
 - b) Immediately after eating
 - c) In fasting state approximately 9-12 hours after eating
 - d) One hour after eating

3. Zollinger-Ellison syndrome is characterized by great elevation of:
 - a) Pepsin
 - b) Cholecystokinin
 - c) Gastrin
 - d) Glucagon
4. What does increase in serum enzyme levels indicate?
 - a) Decreased enzyme catabolism
 - b) Accelerated enzyme production
 - c) Increased glomerular filtration rate
 - d) Tissue damage and necrosis
5. Which of the following tissues is important in vitamin D metabolism?
 - a) Spleen
 - b) Skin
 - c) Pancreas
 - d) Thyroid gland
6. What enzyme is more specific for acute pancreatitis?
 - a) AST
 - b) Amylase
 - c) GGT
 - d) Lipase
7. The other name for vitamin B12 is:
 - a) Riboflavin
 - b) Pyridoxine
 - c) Retinol
 - d) Cyanocobalamin
8. Exogenous triglycerides are transported in the blood in what form?
 - a) Chylomicrons
 - b) Free fatty acids
 - c) Phospholipids
 - d) Cholesteryl esters

9. Which of the following does not directly describe direct bilirubin?
- a) Conjugated in the liver
 - b) Insoluble in water
 - c) Conjugated with glucuronic acid
 - d) Excreted in urine of jaundiced patients
10. Hyperparathyroidism is most consistently associated with:
- a) Hypocalcemia
 - b) Hypophosphatemia
 - c) Hyperphosphatemia
 - d) Metabolic alkalosis
11. The following substance is the precursor of all steroid hormones:
- a) Phospholipid
 - b) Triglyceride
 - c) Fatty acid
 - d) Cholesterol
12. Hyperkalemia can cause all of the following except:
- a) Decreased Vitamin D absorption
 - b) Muscle weakness
 - c) Heart arrhythmias
 - d) Neuromuscular symptoms
13. Urinary excretion of Bence Jones proteins are generally associated with
- a) Heavy chain gammopathy
 - b) Multiple myeloma
 - c) Cytomegalic viral disease
 - d) The dehydrated state
14. The probability that a test result falls within the reference interval in the absence of disease is called the test's
- a) Efficiency
 - b) Negative predictive value
 - c) Specificity
 - d) Sensitivity

15. In what form is glucose stored in the muscle and the liver?
- a) Starch
 - b) Glycogen
 - c) Sucrose
 - d) Maltose
16. The basic unit of protein is called a/an?
- a) Peptide
 - b) Amino acid
 - c) Alpha-protein
 - d) Peptone
17. Which of the following functions as a transport protein for bilirubin in the blood?
- a) Albumin
 - b) Alpha-globulin
 - c) Beta-globulin
 - d) Gamma-globulin
18. The following liver diseases produces the highest elevation of transaminases:
- a) Hepatic cirrhosis
 - b) Alcoholic hepatitis
 - c) Obstructive jaundice
 - d) Hepatic cancer
19. The following sample is usually taken for the liver function testing:
- a) Blood
 - b) Urine
 - c) Sputum
 - d) CSF
20. In patients with Wilson's disease:
- a) There is an autoimmune disorder with the excessive deposition of zinc in the liver
 - b) There is an autoimmune disorder with the excessive deposition of antibiotics in the liver
 - c) There is an auto immune disorder with the excessive deposition of bilirubin in the liver

- d) There is an autoimmune disorder with the excessive deposition of copper in the liver
21. Bile acids that are synthesized from the liver are derived from what substance?
- a) Cholesterol
 - b) Triglyceride
 - c) Bilirubin
 - d) Fatty acid
22. Select the hormone that is associated with galactorrhea, pituitary adenoma and amenorrhea:
- a) Progesterone
 - b) Estradiol
 - c) Estriol
 - d) Prolactin
23. The following hormone is the most abundant corticosteroid produced by the adrenal cortex:
- a) Aldosterone
 - b) Cortisol
 - c) Corticosterone
 - d) Dehydroepiandrosterone
24. Select the main estrogen produced by the ovaries and used to evaluate ovarian function:
- a) Estriol
 - b) Estradiol
 - c) Epiestriol
 - d) Hydroxyestrone
25. Which of the following is the function of the human liver?
- a) Production of bile
 - b) Metabolization of fats
 - c) Metabolization of carbohydrates
 - d) All of the above.
26. The following laboratory result is most likely in females with ovarian failure:
- a) Decreased LH, FSH and estrogen
 - b) Increased LH, FSH and estrogen

- c) Decreased prolactin and estrogen
 - d) Increased progesterone only
27. Cirrhosis is a liver disease described by the abnormal structure and functioning of the liver. This is mainly diagnosed by:
- a) Blood Test
 - b) Liver biopsy
 - c) Physical examination
 - d) All of the above
28. The following condition is characterized by primary hyperaldosteronism caused by adrenal adenoma, carcinoma or hyperplasia:
- a) Pheochromocytoma
 - b) Cushing's syndrome
 - c) Conn syndrome
 - d) Addison's disease
29. The thyroid hormones are derived from the amino acid:
- a) Methionine
 - b) Phenylalanine
 - c) Histidine
 - d) Tyrosine
30. Select the most appropriate single screening test for thyroid disease:
- a) Thyroid stimulating hormone (TSH) assay
 - b) Free thyroxine index
 - c) Total thyroxine
 - d) Total tri-iodothyronine assay
31. Which route of drug administration is associated with 100% bioavailability?
- a) Intramuscular
 - b) Sublingual
 - c) Intravenous
 - d) Oral

32. Which electrolyte level best correlates with plasma osmolality?
- a) Sodium
 - b) Chloride
 - c) Bicarbonate
 - d) Calcium
33. The main extracellular ions include:
- a) Sodium and potassium
 - b) Sodium and chloride
 - c) Potassium and hydrogen
 - d) Sodium and bicarbonate
34. Point of care testing means:
- a) Care of patient during testing
 - b) Taking care during testing
 - c) Testing the patient at bedside
 - d) Taking patients at satellite laboratory
35. The following biochemical process is promoted by insulin:
- a) Lipolysis
 - b) Glycogenolysis
 - c) Gluconeogenesis
 - d) Uptake of glucose by cells
36. Urea is produced from:
- a) Oxidation of purine
 - b) Catabolism of proteins and amino acids
 - c) Oxidation of pyrimidines
 - d) Breakdown of complex carbohydrates
37. A 52-year old female with a family history diabetes mellitus is likely to develop:
- a) Type 1 diabetes mellitus
 - b) Type 2 diabetes mellitus
 - c) Gestational diabetes mellitus
 - d) Secondary diabetes mellitus

38. The test used to monitor the glycemic status of patients over a period of three-to-four months is called:
- a) Fasting blood sugar
 - b) Fructosamine
 - c) Glycated hemoglobin (HbA1C)
 - d) Uristix
39. Which of the following enzymes is used to assess the amount of cardiac muscle damage during myocardial infarction?
- a) AST
 - b) Amylase
 - c) Lipase
 - d) Creatine Kinase
40. Examination findings suggestive of chronic liver disease include:
- a) Caput medusae.
 - b) Nausea and vomiting.
 - c) Gynaecomastia.
 - d) Tender hepatomegaly.
41. Jaundice in viral hepatitis can be classified under:
- a) Hepatocellular
 - b) Obstructive
 - c) Hemolytic
 - d) Congenital hyperbilirubinemia
42. The mode of transmission of hepatitis A virus infection is via:
- a) Fecal-oral
 - b) Sexual intercourse
 - c) Needle prick injuries
 - d) Droplets in the air
43. Which of the following vitamins is stored in the liver?
- a) Vitamin K
 - b) Vitamin D
 - c) Vitamin E

- d) All of the above
44. A female with excessive pubic and facial hair growth (hirsutism) should be tested for which of the following hormones:
- a) Testosterone and dihydroepiandrosterone sulfate
 - b) Human growth hormone
 - c) Human chorionic gonadotropin
 - d) Estrogen and progesterone
45. In diabetic patient, this provides information about the average blood glucose concentration during the preceding 6-8 weeks:
- a) HbA1c
 - b) HbB
 - c) HbF
 - d) HbS
46. Which classification of diabetes mellitus is genetically predetermined, Human Leukocyte Antigen- associated, chronic autoimmune disease with insulin deficiency and glucagons excess as its pathophysiologic sequelae?
- a) Type I
 - b) Non-obese type II
 - c) Obese type II
 - d) Gestational diabetes
47. According to the WHO criteria, patients with type I diabetes mellitus are, at the time of diagnosis, characterized by: 1. hyperglycemia 2. ketonuria 3. ketoacidosis 4. normal weight
- a) Only 1 and 3 are correct.
 - b) Only 1,2, and 3 are correct
 - c) Only 2 and 4 are correct
 - d) 1,2,3 and 4 are correct
48. Quality Control (QC) in chemical Laboratory:
- a) Should be done once a month.
 - b) Should be done regularly
 - c) Should not be performed.

- d) Starts when the specimen is being taken
49. If 20 ml of 80 mg/dl glucose standard is diluted to one litre, the resulting solution would be:
- a) 16 mg/dl
 - b) 1.6 mg/dl
 - c) 1.6 mg/l
 - d) 16 g/dl
50. The indirect reacting bilirubin is:
- a) Water insoluble
 - b) Water soluble
 - c) Alcohol insoluble
 - d) Conjugated

Section B: Short Answer Questions (20 Marks)

1. Kidney disease is a public health problem with increasing prevalence, poor outcomes, and high costs:
 - a) Explain two (2) commonly performed serum analyses that give information about the status of glomerular filtration (4 marks)
 - b) Explain two (2) clinical manifestations of glomerular disease (4 marks)
 2. Describe the role of the laboratory in monitoring heart disease (6 marks)
 3. Describe the standard criteria for the diagnosis of diabetes mellitus (6 marks)
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