CANDIDATE NUMBER.....

AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF HEALTH SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

SLS403: CHEMICAL PATHOLOGY

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL/MAY 2019

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

Write your candidate number on the space provided on top of each page
Answer **all** questions in sections A on the question paper.
Answer **all** questions in section B on separate answer sheets provided.
Answer any **3** questions in section C on separate answer sheets provided
Credit will be given for logical, systematic and neat presentations in sections B and C

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SECTION A : MULTIPLE CHOICE [40MARKS]

- **Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions**
- **Each correct response is allocated half mark**

1. Plasma levels of calcium are influenced by the following

T F a) Renal disease
T F b) Vitamin D
T F c) Calcitonin
T F d) Malabsorption

2. The following acute phase plasma proteins are likely to be increased a few days following injury

T F a) Fibrinogen
T F b) Transferrin
T F c) C-Reactive protein
T F d) Alpha-1 antitrypsin

3. Hypophosphataemia may be caused by

T F a) Vomiting
T F b) Diarrhoea
T F c) Poor diet
T F d) Vitamin D deficiency

4. Regarding the role of parathyroid hormone, it

T F a) Stimulates renal reabsorption of calcium
T F b) Inhibits renal reabsorption of phosphate
T F c) Stimulates bone resorption
T F d) Stimulates synthesis of calcitriol

5. The following ketone bodies are found in excess in the blood of a person suffering from phenylketonuria

T F a) Acetone
T F b) Tyrosine
T F c) Phenylalanine
T F d) Phenylpyruvate

6. Glycosylated haemoglobin

T F a) Is produced by enzymatic glycosylation of haemoglobin
T F b) Level in blood is inversely proportional to average plasma glucose
T F c) Measurement is not reliable in haemolytic anaemia
T F d) Is mainly used in the diagnosis of diabetes

7. Which of the following formulae shows the correct calculation for indirectly measuring LDL-C

T F a) LDL-C = HDL-C + (Triglyceride/5)
T F b) LDL-C = Total Cholesterol – (HDL-C) – (HDL-C) – (Triglyceride/5)
T F c) LDL-C = Total Cholesterol + HDL-C + (Triglyceride/5)
T F d) LDL-C = HDL-C – (Triglyceride/5)

8. An ideal tumor marker should be

T F a) a substance that is released directly into the bloodstream
T F b) easily cleared from the body
T F c) tumor specific
T F d) readily detectable in body fluids

9. Inborn errors of metabolism

T F a) include a wide range of unrelated disorders
T F b) are always sex-linked
T F c) usually affect multiple organ systems
T F d may progress rapidly with life-threatening deterioration over hours

10. The commonest causes of hypercalcaemia are

T F a) milk alkali syndrome
T F b) malignancy
T F c) primary hyperparathyroidism
T F d) pregnancy

11. Changes in plasma protein concentrations can be due to:

T F a) Liver failure
T F b) Renal disease
T F c) Changes in rate of synthesis
T F d) Changes in volume of distribution

12. The following substances are elevated in a patient with phenylketonuria

T F a) leucine
T F b) homocysteine
T F c) lactate
T F d) phenylalanine

13. The following are negative acute phase reactants

T F a) haptoglobin
T F b) transferrin
T F c) albumin
T F d) alpha1 antitrypsin

14. The following cause fasting hypoglycaemia

T F a) Insulin overdose in diabetic patients
T F b) Glycogen storage diseases
T F c) Perinatal stress
T F d) Hypothermia

15. In-born errors of carbohydrate metabolism include

T F a) Fructose intolerance
T F b) Tay-Sachs disease
T F c) Gaucher's disease
T F d) Branched chain ketoaciduria

16. The following biochemical changes are associated with acute renal failure

T F a) ↓ GFR
T F b) ↑ Urea
T F c) ↑ Creatinine
T F d) ↓ K^+

17. Metabolic alkalosis is associated with the following serum results

T F (a) ↑p H
T F (b) ↓K
T F (c) ↓HCO_3^-
T F (d) ↑Pco_2

18. The following laboratory investigations can be used to identify some metabolic complications of malabsorption

T F (a) Serum Na^+
T F (b) Serum Vitamin B12
T F (c) Plasma Cholesterol
T F (d) Plasma Bicarbonate

19. The given cancer markers are used for the diagnosis of the given cancers

			Cancer marker	**Cancer**
T	F	a)	CEA	Hepatoma
T	F	b)	CA-125	Cervical
T	F	c)	PSA	Prostate
T	F	d)	AFP	Prostate

20. Liver cirrhosis is associated with

T F a) Hypoglycaemia
T F b) Hypoalbuminaemia
T F c) Vitamin K deficiency
T F d) Significant elevations of ALT and AST

SECTION B: [20 MARKS]

Answer all questions on separate answer sheets provided

1. State any 5 secondary causes of hyperlipidemia. [5]
2. State the main biochemical differences between metabolic acidosis and respiratory acidosis. [5]
3. State the main laboratory findings associated with nephrotic syndrome.[5]
4. Give an example of each of the following types of cancer markers
   (a) Oncofetal antigens
   (b) Carbohydrates
   (c) Enzymes
   (d) Proteins
   (e) Genetic markers [5]

SECTION C : [75 marks]

Answer any 3 questions from this section on separate answer sheets provided

1. Give an analysis of the complications of diabetes. [25]
2. Give an overview of the laboratory investigation of dyslipidaemia. [25]
3. Explain the role of kidneys in acid-base balance in the body. [25]
4. Give an analysis of the metabolic diseases of the bone. [25]
5. Describe the laboratory diagnosis of malabsorption. [25]