CANDIDATE NUMBER.....

AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHEOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

NSLS403: CHEMICAL PATHOLOGY

END OF SEMESTER FINAL EXAMINATIONS

NOVEMBER 2024

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page.
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets provided
5. Mark allocation for each question is indicated at the end of the question
6. 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. Hyperglycemia in diabetes results from
T F a) defects in insulin secretion
T F b) too much intake of glucose
T F c) cortisol deficiency
T F d) impairment of insulin sensitivity

2. Deficiencies of the following hormone/s can cause hypoglycaemia
T F a) Cortisol
T F b) Glucagon
T F c) Parathyroid
T F d) Growth hormone

3. The following is true about albumin
T F a) It's a positive acute phase protein
T F b) It has got a half life of 40 days
T F c) It's synthesized in the liver
T F d) It's the most abundant plasma protein

4. Nephrotic syndrome is associated with the following
T F a) Hypoalbuminaemia
T F b) Oedema
T F c) Glycosuria
T F d) Hyperlipidaemia

5. Dehydration can be caused by
T F a) Burns
T F b) Cardiovascular disease
T F c) Malaria
T F d) Diabetes

6. Which of the following acid-base disturbances is associated with an abnormally low pH and abnormally high K^+ value in a blood sample
T F a) Metabolic acidosis
T F b) Diabetic ketoacidosis
T F c) Respiratory acidosis
T F d) Metabolic alkalosis

7. Levels of serum calcium can be affected by

T F a) Vitamin D
T F b) Parathyroid hormone
T F c) Albumin
T F d) Magnesium

8. The following laboratory findings are associated with hypophosphataemia

T F a) ↓ Serum calcium
T F b) ↓ Calcitriol
T F c) ↑ ALP
T F d) ↑ Phosphaturia

9. The following are inborn errors of carbohydrate metabolism

T F a) Galactosemia
T F b) Fructose intolerance
T F c) Lactic acidosis
T F d) Pyruvate kinase deficiencies

10. Symptoms of untreated phenylketonuria include

T F a) Eczema
T F b) Lethargy
T F c) Hyperactivity
T F d) Dark pigment

11. The following enzymes are significantly raised in liver cell damage

T F a) ALT
T F b) ALP
T F c) AST
T F d) LDH

12. Jaundice can be caused by

T F a) Decreased conjugation of bilirubin by liver cells
T F b) Biliary obstruction
T F c) Malaria
T F d) Hepatitis A

13. Biochemical markers of Folate deficiency include

T F a) LDH
T F b) Vitamin B12
T F c) Folic acid
T F d) Serum iron

14. Screening tests for malabsorption include
    T F a) Serum Vitamin B12
    T F b) Serum Albumin
    T F c) MCV
    T F d) Hb

15. Which of the following is associated with high acid output in the GIT
    T F a) Duodenal ulcer
    T F b) Gastric ulcer
    T F c) Colon cancer
    T F d) Zollinger Ellison Syndrome

16. Symptoms of Adenine Phosphoribosyltransferase deficiency include
    T F a) Repeated episodes of kidney stones
    T F b) Severe abdominal pain
    T F c) Weight loss
    T F d) Joint pain

17. The following tests are part of the laboratory investigation of amenorrhoea
    T F (a) TSH
    T F (b) FSH
    T F (c) LH
    T F (d) BhCG

18. The following tests can be used in the diagnosis of thyroid disorders
    T F (a) TRH stimulation test
    T F (b) TSH
    T F (c) T3
    T F (d) fT3

19. The following 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. The following laboratory findings are associated with inborn errors of metabolism of mucopolysaccharides
    T F a) Elevated liver enzymes
    T F b) Hypercalcaemia
    T F c) Hypoglycaemia
    T F d) Uraemia

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SECTION B [20 MARKS]
Answer all questions on separate answer sheets provided

1. State any 5 symptoms of Type 2 Diabetes Mellitus.[5]
2. List any 5 causes of secondary hyperlipidaemia. [5]
3. A young woman is admitted to hospital 8 hours after taking an aspirin overdose. The following laboratory results were obtained.

	Result	**Reference range**
Na^+	140 mmol/l	(135 - 145)
K^+	4.7 mmol/l	(3.5 - 5.5)
Cl^-	110 mmol/l	(97 - 107)
HCO_3^-	11 mmol/l	(22 - 26)
pH	7.48	(7.35 – 7.45)
pCO_2	2 kPa	(4.66 – 6.38)

   (a). Comment on and interpret all the biochemical data . [3]
   (b). Work out the possible cause for this acid-base disturbance. [2]

4. State the tests that can be done in a bone profile investigation. [5]

SECTION C [60 marks]
Answer any 3 questions from this section on separate answer sheets provided

1. Discuss the long-term complications of diabetes mellitus. [20]
2. Give a detailed account of the regulation of Calcium and Phosphate in the body.[20]
3. Discuss the biochemical features of jaundice. [20]
4. Give an overview of laboratory investigation of dyslipidaemia. [20]
5. Describe the laboratory diagnosis of malabsorption. [20]