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

NSLS102: CLINICAL CHEMISTRY

END OF SEMESTER FINAL EXAMINATIONS

NOVEMBER 2022

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

Candidate Number……

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. Which of the following are lipids?

T F a) Cholesterol
T F b) Phospholipids
T F c) Glucagon
T F d) Prostaglandins

2. In the context of Clinical Chemistry the following statements are true

T F a) The greatest portion of chemistry testing is quantitative analysis
T F b) Photometers measure light intensity independent of wavelength
T F c) Toxicology is the study of drugs of abuse and other chemicals
T F d) Beer-Lambert's Law is obeyed when a single species is present at relatively high concentrations

3. The following carbohydrates are reducing sugars

T F a) Sucrose
T F b) Lactose
T F c) Galactose
T F d) Glucose

4. Methods for determining proteins include

T F a) Spectrophotometry
T F b) Biuret assay
T F c) Immunoprecipitation
T F d) Western blot

5. Beer-Lambert's Law may be expressed as

T F a) Log (1/T)
T F b) A=abc
T F c) (I_o/I_s) x 100
T F d) C = abc

6. Regarding uncompetitive enzyme inhibition

T F a) Inhibitor binds to enzyme
T F b) V_{max} is increased
T F c) K_m is increased
T F d) Inhibitor binds to enzyme substrate complex

Candidate Number……

7. Measurement of albumin may be used to
T F a) evaluate liver function
T F b) assess nutrition status
T F c) determine phosphate balance
T F d) aid in the diagnosis of heart disease

8. The following factors influence rate of enzymatic reactions
T F a) Substrate Concentration
T F b) Enzyme Concentration
T F c) pH
T F d) Temperature

9. Which of the following are anticoagulants in sample collection tubes?
T F a) sodium chloride
T F b) EDTA
T F c) sodium acetate
T F d) heparin

10. The basic unit of a carbohydrate is called
T F a) Peptide
T F b) Amino acid
T F c) Alpha-protein
T F d) Monosaccharide

11. The following principles are mainly used in clinical chemistry tests
T F a) Spectrophotometry
T F b) Flow cytometry
T F c) Turbidimetry
T F d) Agglutination

12. Nephelometry is ideal for the measurement of
T F a) Glucose
T F b) Iron
T F c) Fibrinogen
T F d) C-reactive protein

13. Blood glucose concentration is affected by
T F a) Deamination
T F b) Glycogenesis
T F c) Lipolysis
T F d) Transamination

Candidate Number……

14. Denaturation of proteins mainly affects the following bonds
T F a) Peptide bonds
T F b) Hydrogen bonds
T F c) Van der Waal's forces
T F d) Ionic bonds

15. Hypoproteinaemia can be caused by
T F a) Dehydration
T F b) Paraproteinaemia
T F c) Septicaemia
T F d) Liver disease

16. The following are positive acute phase proteins
T F a) Haptoglobulin
T F b) Ceruloplasmin
T F c) α1-antitrypsin
T F d) C-reactive protein

17. Cholesterol is used to synthesize
T F a) Vitamin D
T F b) Progesterone
T F c) Bile acids
T F d) Insulin

18. Both VLDL and LDL contain the following apolipoproteins
T F a) B100
T F b) B48
T F c) C
T F d) E

19. The lipid profile results associated with cardiovascular disease include
T F a) ↑VLDL
T F b) ↑TG
T F c) ↓HDL
T F d) ↓IDL

20. A Liver Function Test panel consists of
T F a) LDH
T F b) ALP
T F c) AST
T F d) Transferrin

Candidate Number……

SECTION B [20 MARKS]

Answer all questions on separate answer sheets provided

1. State one major use of the following lipoproteins
   a) Chylomicrons
   b) HDL-C
   c) VLDL-C
   d) LDL-C
   e) IDL-C [5]
2. List any 5 causes of hypoglycaemia. [5]
3. State any 5 laboratory findings associated with Multiple Myeloma.[5]
4. Give one example of each of the following classes of enzymes
   a) Transferases
   b) Oxidoreductases
   c) Hydrolases
   d) Lyases
   e) Isomerases [5]

SECTION C [75 marks]

Answer any 3 questions from this section on separate answer sheets provided. Each question carries 25 marks.

1. Write a detailed account of the laboratory investigation of dyslipidemia. [25]

2. Describe the Glucose oxidase and Hexokinase methods for measurement of blood Glucose. [25]

3. Give a detailed account of electrophoretic separation of proteins. [25]

4. Discuss the laboratory tests that can be used to diagnose a patient suspected of having myocardial infarction. [25]

5. Describe the detailed structure and function of a spectrophotometer. [25]