



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR**

**THIRD YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DIPLOMA  
IN  
MEDICAL LABORATORY SCIENCE  
DIRECT ENTRY**

**MAIN EXAM**

**COURSE CODE: BMD 327**

**COURSE TITLE: CLINICAL CHEMISTRY II**

**DATE: 10<sup>TH</sup> DECEMBER 2020**

**TIME: 2.00 -4.00 PM**

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**INSTRUCTIONS TO CANDIDATES**

This paper is divided into three sections, **A B** and **C**, carrying respectively: Multiple Choice Questions (**MCQs**), Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**).

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

## SECTION A (MCQs)

Answer all questions

- 1) Which one of the following is not a biomarker of cardiovascular disease?
  - A. Myoglobin
  - B. Cystatin C
  - C. CK-MB
  - D. Troponin I
- 2) Alkaline phosphatase is an enzyme found in the following body tissues EXCEPT?
  - A. Liver
  - B. Bone
  - C. Skeletal muscle
  - D. Placenta
- 3) Renal pelvis refers to;
  - A. The blood vessel that carries the blood from the kidney to the heart
  - B. The blood vessel that brings the cardiac output to the kidney.
  - C. The location where all the collecting ducts drain to form the ureter.
  - D. Location where the renal artery. Renal vein and the ureters enter the kidney.
- 4) Cystatin C is preferred as a more sensitive biomarker of glomerular filtration over Urea because;
  - A. Its relatively easy to sample
  - B. It is produced and destroyed at a fairly constant rate.
  - C. It is associated with an increased risk of cardiovascular disease and heart failure.
  - D. Assays for cystatin C are cheaper compared to those Urea
- 5) Which of the following products of the Berthelot reaction for Urea determination is reacted with phenol and hypochlorite to give a colored complex?
  - A. Carbon dioxide.
  - B. Hydrogen peroxide.
  - C. Ammonia.
  - D. Bicarbonate ions.
- 6) Which of the following hormones is produced in the juxtaglomerular cells of the kidney and plays an indirect role in regulation of blood pressure by cleaving angiotensinogen?
  - A. Angiotensin I.
  - B. Angiotensin II.
  - C. Renin.
  - D. Erythropoietin.
- 7) Which of the following liver diseases is characterized by scarring of liver cells as a result of chronic liver injury?
  - A. Cystic Fibrosis.
  - B. Wilson's disease.
  - C. Liver cirrhosis.
  - D. Viral hepatitis.
- 8) The main function of Troponin I in the cardiac muscle is?
  - A. Binding the troponin complex to tropomyosin.
  - B. Inhibiting the binding of actin and myosin.
  - C. Regulating the levels of Troponin C
  - D. Binding to calcium to reverse the inhibitory activity of TnT.
- 9) Which of the following gastrointestinal disease causes tumors that lead to overproduction of gastric acid?
  - A. Pancreatitis
  - B. Zollinger-Ellison syndrome.
  - C. Cystic fibrosis

- D. Hepatitis.
- 10) The enzyme Amylase plays a crucial role in the breakdown of starch and glycogen during digestion and its production is carried out by the?
- A. skeletal muscle and the
  - B. small intestine and
  - C. acinar cells of the pancreas
  - D. fallopian tube.
- 11) Lipase is considered a better biomarker for pancreatic disorders than amylase because?
- A. It is found in high concentrations in the pancreas
  - B. It can be measured by use of turbidimetric methods
  - C. Amylase elevations can persist for longer periods of up to 8 days
  - D. It is readily available
- 12) Specialized cells known as somatotrophs are found in the pituitary gland and are responsible for the production of?
- A. Prolactin
  - B. Thyroxine
  - C. Growth hormone'
  - D. Triiodothyronine
- 13) Which of the following causes excess levels of growth hormone in the human body?
- A. A benign tumor of the thyroid gland
  - B. Excessive secretion of thyroxine
  - C. Ectopic production of Growth hormone.
  - D. Overproduction of dopamine
- 14) The following are functions of prolactin **EXCEPT**?
- A. Initiating secretion of milk by the mammary glands.
  - B. Reduction of fertility during lactation.
  - C. Maintaining the corpus luteum.
  - D. Stimulating production of thyroid hormones by the thyroid gland.
- 15) The following molecules can be used as tumor markers **EXCEPT**?
- A. Hormones.
  - B. Metabolites.
  - C. Receptors.
  - D. Minerals.
- 16) Alfa fetal protein is used in the staging, diagnosis monitoring progress of?
- A. Squamous cell carcinoma
  - B. Hepatocellular carcinoma
  - C. Pancreatitis
  - D. Lung carcinoma
- 17) The cancer antigen- 125 is used as a serologic marker of?
- A. Ovarian cancer
  - B. Prostate cancer
  - C. Colon cancer
  - D. Breast cancer
- 18) The prostate specific antigen circulates in the body bound to?
- A. Albumin
  - B. Fibrinogen
  - C.  $\alpha$ 2-macroglobulin
  - D. amylase
- 19) The presence of a prominent jaw, a large nose, and large hands and feet, as well as enlargement of most other tissues, including the tongue, heart, liver, and kidneys are all symptoms associated with?

- A. Hypopituitarism/
  - B. Acromegaly.
  - C. Dwarfism.
  - D. Hypertension.
- 20) The malabsorption syndrome which typically involves abnormal digestion or absorption of proteins, polysaccharides, carbohydrates, and other complex molecules, as well as lipids is normally seen in?
- A. Arthritis
  - B. Meningitis
  - C. Pancreatitis
  - D. Cystic fibrosis

## **SECTION B**

### **Answer all questions.**

- 1) List five functions of the human liver (5 marks)
- 2) Write brief notes on the following liver diseases
  - a) Hepatitis (3marks)
  - b) Liver cirrhosis (3 marks)
  - c) Alcoholic liver disease (2 marks)
- 3) Describe the creatinine clearance test (CrCl) (8marks)
- 4) Describe functions of the human kidney (6 marks)
- 5) Briefly discuss the role of Hemoglobin in transport of CO<sub>2</sub> and buffering (5marks)
- 6) List down four causes of growth hormone deficiency (4 marks)
- 7) Describe the role of Thyroid Stimulating hormone in regulation of Thyroid hormones (4marks)

## **SECTION C**

### **Answer all questions.**

- 1) Discuss the maintenance of acid base balance by the lungs and kidneys (20 marks)
- 2) Discuss the various biomarkers of cardiac damage including their tissue sources, clinical significance and assay for enzyme activities (20 marks)
- 3) Discuss liver function tests citing their clinical significance, assay principle, assay for enzyme activity (20 marks)