(*University of Choice*)

# MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

**MAIN CAMPUS**

## UNIVERSITY EXAMINATIONS
## 2019/2020 ACADEMIC YEAR

## FOURTH YEAR FIRST SEMESTER EXAMINATIONS

## FOR THE DEGREE
## OF
## BACHELOR OF SCIENCE MEDICAL BIOTECHNOLOGY
## MAIN EXAM

**COURSE CODE:** **BML 427**

**COURSE TITLE:** **CLINICAL PHYSIOLOGY**

**DATE:** 19th October 2020 **TIME:** 11.00 AM – 1.00 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

This Paper Consists of 5 Printed Pages. Please Turn Over.

**BML 427: CLINICAL PHYSIOLOGY (Main Exam)**

**TIME: 2 HOURS**

**SECTION A**: MULTIPLE CHOICE QUESTIONS (20 marks)

1. Which one of the following conditions can be treated using angioplasty?
   a. Pulmonary edema
   b. Valvular incompetence in the heart
   c. Thrombosis in the coronary artery
   d. Cardiac failure
2. On performing urinalysis a laboratory technologist establishes presence of bacteria in a urine specimen. Which one of these would be a valid conclusion about the patient who provided the urine specimen?
   a. He is in end-stage renal failure
   b. He has urethral obstruction
   c. He has a urinary tract infection
   d. He has diabetes mellitus

3. Anemia is one of the important symptoms observed in patients with chronic renal failure. What is the most effective way to treat this type of anemia?
   a. By administration of Iron supplements to the patient
   b. By parenteral administration of Vitamin $B_{12}$ to the patient
   c. By giving the patient a blood transfusion
   d. By parenteral administration of recombinant erythropoietin to the patient

4. Which one of the following promotes spermatozoa maturation in the testicular germinal epithelium?
   a. Follicle-stimulating hormone
   b. Luteinizing hormone
   c. Testosterone
   d. Androstenedione
5. Which one of the following is the underlying cause of respiratory distress syndrome (RDS)?
   a. Development of fibrous tissue in the lungs
   b. Presence of edema in the small airways
   c. Hypersecretion of mucus in the small airways
   d. Inadequacy of surfactant in the alveoli
6. Which of the following is **NOT TRUE** about coronary artery atherosclerosis?
   a. It may cause angina pectoris
   b. It may cause myocardial infarction
   c. It may cause hypertension
   d. It may cause ischemic heart disease

7. Why is nephrotic syndrome characterized by hypoalbuminemia?
    a. Because of failure by the liver to synthesize albumin
    b. Because albumin leaks from the vascular system into the interstitial fluid compartment
    c. Because the associated malnutrition leads to inadequacy of amino acids for albumin synthesis
    d. Because of loss of albumin in urine

8. Which one of the following mediators of inflammation is implicated in the immunopathology of bronchial asthma?
    a. Prostaglandins
    b. Thromboxanes
    c. Leukotrienes
    d. Prostacyclins
9. Which one of the following is a marker of myocardial injury?
    a. Plasma levels of actin
    b. Plasma levels of myosin
    c. Plasma levels of albumin
    d. Plasma levels of troponin
10. Which one of the following respiratory conditions is characterized by alveolar collapse?
    a. Chronic bronchitis
    b. Pulmonary emphysema
    c. Atelectasis
    d. Small airways disease

11. Why are Angiotensin II receptor antagonist drugs used in the reduction of cardiac work in patients who have previously suffered a myocardial infarction?
    a. Because they decrease the rate of contraction of the heart
    b. Because the decrease the force of contraction of the heart
    c. Because they improve the blood supply to the myocardium
    d. Because they decrease the total peripheral resistance of the vascular system

12. Which one of the following is **NOT** a possible cause of urinary tract obstruction?
    a. Presence of renal calculi
    b. Benign prostatic hyperplasia
    c. Nephrotic syndrome
    d. Ureteral obstruction
13. Which one of the following may occur as a result of presence of an adenoma of the anterior pituitary gland?
    a. Elevated plasma levels of Antidiuretic Hormone (ADH)
    b. Elevated plasma levels of oxytocin
    c. Elevated plasma levels of prolactin

d. Elevated plasma levels of aldosterone

14. What is the primary cause of glomerulonephritis in patients with Systemic Lupus Erythematosus (SLE)?
    a. Antibody deposition on the glomerular basement membrane
    b. Bacterial infection of the glomeruli
    c. Immune complex deposition on the glomerular basement membrane
    d. Nephrotic syndrome
15. Which one of the following is a primary consequence of cardiac failure?
    a. A reduced peripheral resistance of the vascular system
    b. A reduced heart rate
    c. A reduced blood supply to the heart
    d. A reduced stroke volume

16. Which one of the following conditions of the respiratory tract is characterized by markedly increased production of bronchial secretions?
    a. Bronchial asthma
    b. Atelectasis
    c. Chronic bronchitis
    d. Pulmonary emphysema
17. Which one of the following may cause diabetes insipidus?
    a. Excessive secretion of ACTH
    b. Excessive secretion of ADH
    c. Inadequate secretion of aldosterone
    d. Inadequate secretion of ADH
18. Which one of the following is responsible for the secretion of surfactant within the alveoli?
    a. Goblet cells in the upper respiratory tract
    b. Type I alveolar epithelial cells
    c. Type II alveolar epithelial cells
    d. Mesenchymal cells in the bronchiolar smooth muscle

19. Why is there increased secretion of parathyroid hormone in patients with end stage renal failure:
    a. Because of high blood calcium levels
    b. Because of parathyroid gland hypertrophy
    c. Because of increased calcium reabsorption from the glomerular filtrate
    d. Because of low blood calcium levels
20. Why are $\beta_1$- adrenergic receptor antagonist drugs used in the treatment of patients who have previously suffered a myocardial infarction?
    a. Because they increase the force of contraction of the heart
    b. Because they increase the rate of contraction of the heart
    c. Because they decrease the rate of contraction of the heart

d. Because they promote increased blood flow through the myocardium

**SECTION B: SHORT ESSAY QUESTIONS** (40 marks)

1. Explain the measures that need to be undertaken to prevent graft rejection in renal transplant surgery. (10 marks)

2a. Explain the term "Ischemic Heart Disease" (IHD). (3 marks)

b. Explain the role of hyperlipidemia in the etiology of ischemic heart disease. (7marks)

3. Discuss the pathophysiology of the Respiratory Distress Syndrome. (10 marks)

4. Describe the secretion and physiological effects of Adrenocorticotropic Hormone (ACTH). (10 marks)

**SECTION C: LONG ESSAY QUESTIONS** (60 marks)

1. Discuss the pathophysiology of bronchopneumonia. (20 marks)

2. Discuss the endocrine disturbances that may occur in a patient with end- stage renal failure. (20 marks)

3. Discuss the physiological effects of gonadotropins on the following:

   a. The male reproductive system (10 marks)
   b. The female reproductive system (10 marks)