

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2020/2021**

**SUPPLEMENTARY/SPECIAL EXAMINATION FOR THE DEGREE OF BACHELOR**

**INS 2102: MEDICAL PHYSIOLOGY I**

**DATE: MARCH 2021 TIME: 3 HOURS**

**PART 1: MULTIPLE CHOICE QUESTIONS (10 MARKS)**

1. Which of these hormones used cAMP as a second messenger?

a. Testosterone

b. Cortisol

c. Insulin

d. Epinephrine

2. Most of the carbon dioxide in the blood is carried in the form of:

a. Dissolved CO2

b. Carboxy haemoglobin

c. Carbaminohaemoglobin

d. Bicarbonate

3. Which of these would be most affected by a decrease in the affinity of hemoglobin for oxygen?

a. Arterial PO2

b. Arterial percent oxyhemoglobin saturation

c. Venous oxyhemoglobin saturation

d. Arterial PCO2

4. The appearance of glucose in urine

a. Occurs normally

b. Indicates the presence of kidney disease

c. Occurs only when the transport carriers for glucose become saturated.

d. Is a result of hypoglycemia

5. Which of the following consists of dense parallel arrangements of collagen fibers?

a. Skeletal muscle tissue

b. Nervous tissue

c. Tendons

d. Dermis of the skin

6. The organelle that contains digestive enzyme is

a. The mitochondria

b. The lysosome

c. The endoplasmic reticulum

d. The golgi complex

7. Enzymes increase the rate of chemical reactions by

a. Increasing the body temperature

b. Decreasing the blood PH

c. Increasing affinity of reactant molecules for each other.

d. Decreasing the activation energy of the reactant.

8. Production of which of the following blood cells is stimulated by a hormone secreted by the kidney?

a. Lymphocytes

b. Erythrocytes

c. Thrombocytes

d. Neutrophils

9. In an isotonic muscle contraction

a. The length of the muscle remains constant

b. The muscle tension remains constant

c. Both muscle length and tension are changed.

d. Movement of bones does not occur.

10. Which of these would be most affected by a decrease in the affinity of hemoglobin for oxygen?

a. Arterial PO2

b. Arterial percent oxyhemoglobin saturation

c. Venous oxyhemoglobin saturation

d. Arterial PCO2

**PART II: SHORT ANSWER QUESTIONS (50 MARKS)**

1. Explain how oxygen transport is influenced by changes in blood PH and temperature. (5 marks)

2. Explain the respiratory adjustments to life at a high altitude. (5 marks)

3. Explain the role of aldosterone in the regulation of blood volume and blood pressure. (5 marks)

4. Explain the mechanisms by which blood flow to the heart and skeletal muscles is regulated? (5 marks)

5. Explain how electrocardiogram waves are produced? (5 marks)

6. Describe the ABO system of red blood cell antigens. (5 marks)

7. Compare cardiac muscle and skeletal muscle in terms of structure and physiology. (6 marks)

8. Describe how muscles fatigue. (4 marks)

9. Describe the role of the Na+ – K+ pump in the maintenance of the resting membrane potential. (5 marks)

10. Distinguish between the different types of cell signaling. (5 marks)

**PART III: ESSAY/LONG ANSWER QUESTIONS (40 MARKS)**

1. Describe the transport processes involved in the epithelial absorption of glucose. (20 marks)

2. Describe the mechanisms that contribute to and that help compensate for the conditions of hypertension, circulatory shock and congestive heart failure.

(20 marks)