MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR
FIRST YEAR SECOND TRIMESTER

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES
BACHELOR OF SCIENCE IN NURSING

COURSE CODE: NUR 1203
COURSE TITLE: MEDICAL PHYSIOLOGY

DATE: 16/5/2024 **TIME: 0830-1030 HRS**

INSTRUCTION TO CANDIDATES

Section A: Multiple Choice Questions. Answer ALL Questions
Section B: Short Answer Questions. Answer ALL Questions
Section C: Long Answer Questions. Answer Question ONE and any other ONE question.

This paper consists of 6 printed pages. Please turn over.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS) SELECT THE CORRECT ANSWER.

1.Which of the following respiratory volumes represents the maximum volume of air that can be exhaled after a maximum inhalation?

A. Tidal volume
B. Inspiratory reserve volume
C. Expiratory reserve volume
D. Vital capacity

2.Which of the following physiological situation would decrease the rate of oxygen diffusion across the respiratory membrane?

A. Increased surface area
B. Increased blood flow
C. Thickening of the alveolar walls
D. High concentration of hemoglobin

3.Which phase of gastric secretion is initiated by the sight, smell, or taste of food?

A. Cephalic phase
B. Gastric phase
C. Intestinal phase
D. Secretory phase

4.During stimulation of gastric acid secretion, what is the primary function of enterochromaffin-like cells (ECL cells)?

A. Secretion of mucus
B. Secretion of histamine
C. Secretion of gastrin
D. Absorption of vitamin B12

5.What is the primary role of hydrochloric acid in the stomach?

A. Activate pepsinogen to pepsin
B. Break down carbohydrates
C. Emulsify fats
D. Neutralize gastric enzymes

6. At what age does red blood cell production shift exclusively to the bone marrow?

A. At birth
B. 2 years old
C. 5 years old
D. 10 years old

7. What is the primary function of erythropoietin?

A. Stimulating the production of white blood cells
B. Speeding up the maturation of platelets
C. Enhancing the production of red blood cells
D. Inhibiting the production of red blood cells

8. Which cell type is responsible for the production of antibodies?
A. Erythrocytes
B. Platelets
C. Neutrophils
D. Lymphocytes

9. Which cell type is associated with granulocytosis?
A. Eosinophils
B. Monocytes
C. Platelets
D. Lymphocytes

10.Hypernatremia refers to:
A. Decreased plasma sodium concentration
B. Increased plasma sodium concentration
C. Decreased plasma chloride concentration
D. Increased plasma chloride concentration

12. Which of the following solutions is commonly administered intravenously for nutritional purposes?
A. Glucose
B. Sodium chloride
C. Calcium phosphate
D. Potassium chloride

13. How is the image formed on the retina described?
A. Upright and reversed
B. Inverted and reversed
C. Upright and unreversed
D. Inverted and unreversed

14. Which hormone increases the rate of many chemical reactions in almost all the body's cells?
A. Insulin
B. Thyroxine
C. Growth hormone
D. Cortisol

15.What is the primary function of oxytocin?

A. Regulate blood sugar levels
B. Control thyroid function
C. Stimulate hematopoiesis
D. Stimulate uterine contractions and milk ejection

16. Activation of the parasympathetic nervous system results in:
A. Increased heart rate
B. Bronchodilation
C. Pupil dilation
D. Increased gastrointestinal motility

17.Cerebral blood flow is regulated by changes in:
A. Blood viscosity
B. Cerebrospinal fluid production
C. Arterial carbon dioxide levels
D. Plasma protein concentration

18. The Normal ElectrocardiogramThe P wave in an electrocardiogram represents:
A. Ventricular depolarization
B. Atrial depolarization
C. Ventricular repolarization
D. Atrial repolarization

19. In vectorial analysis of the heart's electrical activity, which vector corresponds to ventricular depolarization?
A. QRS complex
B. P wave
C. T wave
D. PR

20. Calcium released from the sarcoplasmic reticulum binds to which molecule, leading to muscle contraction?
A. Actin
B. Myosin
C. Troponin
D. Tropomyosin

SECTION B: SHORT ANSWER QUESTIONS (40 MARKS). ANSWER ALL QUESTIONS

1. a) State the key differences between the intrinsic and extrinsic pathways of blood clotting (6 Marks)

b) Explain what is meant by the tripping mechanism of thirst control (2 Marks)

2. a) Compare and contrast the roles of B cells and T cells in the immune system (6 Marks)

b) State the primary roles of vitamin B12 in the body (2 marks)

3. a) Explain the mechanism of gaseous exchange in the lungs (6 marks)

b) Explain the term compliance of the lungs (2 Marks)

4. a) Describe the pathways and mechanism underlying the processing and interpretation of visual information (6 Marks)

b) State the difference between hyperopia and myopia (2 Marks)

5. a) Describe the dorsal column medial lemniscus pathway of sensory transmission in the spinal cord (6 Marks)

b) Distinguish between referred and visceral pain (2 marks)

SECTION C: LONG ANSWER QUESTIONS.QUESTION ONE IS COMPULSORY, THEN CHOOSE EITHER QUESTION 2 OR 3.

1. A patient admitted in Narok County Referral Hospital demonstrates 10% occlusion of one of the coronary arteries. The patient suddenly begins complaining of chest pain, the Nurse covering the anticipates that this could be unstable angina.

a) Describe the sequence of events during one full cardiac cycle (12 Marks)

b) Explore the process of oxygen transport by Blood (8 Marks)

2. A 32-year-old Woman presents to the hospital with infertility concerns she reports regular menstrual cycles but has been unable to conceive. Now she has been sent for ovulatory status assessment.

a) Discuss the physiological events of ovulation encompassing hormonal regulations (12 Marks)

b) Describe the fetal pathway for circulation (8 Marks)

3. Acute (sudden) kidney failure is the sudden loss of the ability of the kidneys to remove waste and concentrate urine without losing electrolytes

a) Describe the renal mechanism of acid base balance in the body (12 Marks)

b) Describe the concept of feedback loops in homeostasis (8 Marks)

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