



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2022

SCHOOL OF NURSING

REGULAR PROGRAMME

NUR/UNUR 109: MEDICAL PHYSIOLOGY II

Date: APRIL 2022

Duration: 3 Hours

INSTRUCTIONS: i) All questions are compulsory

ii) Indicate the answers in the answer booklet provided

PART -I: MULTIPLE CHOICE QUESTIONS (MCQs)

(20 MARKS):

1. The Expiratory Reserve Volume (ERV) at the deepest possible expiration measures:
 - a) 3100 ml
 - b) 2400 ml
 - c) 1200 ml
 - d) 1700 ml
2. The main function of surfactant in the alveoli is:
 - a) Prevention of alveolar disease
 - b) Provide moisture to the lung tissue
 - c) To increase work associated with breathing
 - d) To reduce surface tension at the air – water interface in the alveoli
3. The volume of gas not equilibrating with blood (wasted ventilation) in the lungs is referred to as:
 - a) Anatomic dead space
 - b) Physiologic dead space

- c) Alveolar ventilation
 - d) Residual volume
4. Which of the following centers coordinates the vomiting reflex?
- a) Pons
 - b) Cerebellum
 - c) Cerebral cortex
 - d) Medulla oblongata
5. The formation of urine in the kidney is achieved by one of the following mechanisms
- a) Tubular absorption
 - b) Tubular re absorption
 - c) Counter current mechanism
 - d) Negative feedback mechanism
6. During fetal period the hormone erythropoietin is produced by:
- a) Fetal liver
 - b) Kidney
 - c) Placenta
 - d) Bone marrow
7. The commonest form of thyroid gland overactivity is:
- a) Simmonds disease
 - b) Graves disease
 - c) Goitre
 - d) Exophthalmos
8. Which of the following is a digestive function of the liver?
- a) Activation of Vitamin D
 - b) Secretion of bile

- c) Detoxification of drugs
 - d) Conversion of glucose to glycogen
9. Which of the following is **true** regarding the collecting ducts in the kidney?
- a) Can actively transport water molecules in the urine
 - b) Are the site of most of renal water re – absorption
 - c) Are rendered impermeable to water by antidiuretic hormone (ADH)
 - d) Determine to a large extent the final osmolality of urine
10. Severe diarrhea causes a decrease in one of the following:
- a) Body potassium (K)
 - b) Body sodium (Na)
 - c) Blood HB
 - d) Total peripheral resistance
11. Short stature is seen in adults who in childhood suffered the following effects:
- a) Castration
 - b) Chronic malnutrition
 - c) Premature baby
 - d) Vitamin K deficiency
12. The kidney uses one of the following mechanisms to produce hypertonic or hypotonic urine:
- a) Tubular reabsorption
 - b) Counter current mechanism
 - c) Positive feedback mechanism
 - d) Negative feedback mechanism
13. Which of the following is a plasma protein?
- a) Fibrinogen
 - b) Glycogen
 - c) Hemoglobin

d) Myosin

14. The main resistance vessels in blood circulation are:

- a) Arteries
- b) Arterioles
- c) Veins
- d) Venules

15. Which of the following organs has the greatest blood flow per 100g tissue?

- a) Brain
- b) Heart muscle
- c) Skin
- d) Liver
- e) Kidneys

16. An organ X, is known to serve all of the following functions in the body: Hormone synthesis, protection, storage of excess blood, regulation, irritability. What is the most likely identity of organ X?

- a) Liver
- b) Spleen
- c) Skin
- d) Kidney

17. Which of the following statements is **true** regarding lymph flow from the foot?

- a) Increases when an individual rises from the supine to the standing position
- b) Increases by massaging the foot
- c) Increases when capillary permeability is decreased
- d) Decreases when the valves of the leg veins are incompetent

18. Menstruation occurs in response to?

- a) A fall in the concentration of circulating relaxin
 - b) A fall in the concentration of circulating progesterone
 - c) An increase in the concentration of circulating oestrogen
 - d) An increase in the concentration of circulating oxytocin
19. Which of the following is **true** regarding lymphocytes?
- a) All originate from the bone marrow
 - b) Convert to monocytes in response to antigens
 - c) Interact with eosinophils to produce platelets
 - d) Are part of the body's defense against cancer
20. Which of the following correctly describes systemic circulation?
- a) Right ventricle -> Lungs -> Left atrium
 - b) Left ventricle -> Aorta -> All organs -> Veins -> Vena cava -> Right atrium
 - c) Right atrium -> Right ventricle -> Pulmonary artery -> Lungs
 - d) Pulmonary vein -> Left atrium -> Left ventricle -> Aorta -> Arteries -> Veins -> Right heart

PART-II: SHORT ANSWER QUESTIONS

(40 MARKS):

1. a) Define Gastric motility? **(1 mark)**
b) State **three** factors that influence gastric motility. **(3 marks)**
2. State the main activity in each of the following parts of the nephron **(5 marks)**
- a) Glomerulus
 - b) Proximal convoluted tubule
 - c) Loop of Henle
 - d) Distal convoluted tubule
 - e) Collecting ducts

3. a) State **three** forms in which carbon dioxide is transported from the tissues to the lungs in active tissues. **(3 marks)**
- b) State the effects of the following on the release of oxygen to the tissues: **(3 marks)**
- Temperature
 - pH
 - DPG (2 – Diphosphoglycerate)
4. Distinguish between the following:
- a) Respiratory alkalosis and metabolic alkalosis **(2 marks)**
- b) Respiratory acidosis and metabolic acidosis **(2 marks)**
5. a) State the cellular components of blood and their main functions. **(3 marks)**
- b) State **three** mechanisms that arrest bleeding (haemostasis) in the human body when blood vessels are ruptured. **(3 marks)**
6. Explain how the lungs and the kidneys maintain acid – base balance in the body fluids: **(4 marks)**
7. a) List down **four** functions of the stomach: **(2 marks)**
- b) Explain the significance of Intrinsic Factor (IF) in digestion. **(2 marks)**
8. a) State **four** non – digestive functions of saliva. **(4 marks)**
- b) Outline **three** neural reflex phases associated with gastric secretion and motility. **(3 marks)**

PART III: LONG ANSWER QUESTIONS (LAQs) (40 MARKS)

1. Regarding the cardiovascular system (CVS):
- a) Define a complete cardiac cycle with reference to the major phases and duration **(2marks)**

- b) Outline the conducting system of the heart indicating all the components involved in the origin of the heart beat. **(8 marks)**
- c) Illustrate the components of an electrocardiogram (ECG) with a well labelled diagram and state what each component represents. **(8 marks)**
- d) Explain the clinical significance of an electrocardiogram. **(2 marks)**
2. Regarding the digestive system:
- a) Describe the events that occur in the mouth, stomach and intestines after a meal of maize and beans (Include all the enzymes involved and the end products). **(20 marks)**

END