AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
End of Semester December 2024 Examinations

COURSE CODE AND TITLE: BSN 113- Medical Physiology I

DATE:

TIME: 2 HOURS **START: 9:00AM** **END: 11:00AM**

Instructions

1) This exam is out of 70
2) This paper has three sections: Section I: Multiple choice Questions (MCQ) (20 marks), Section II: Short answer questions (SAQ) (30 marks) and Section III: Long answer question (LAQ) (20marks)
3) Answer **ALL** questions in Section I and Section II and III
4) Answer all the questions in the examination booklets provided
5) Any rough work to be done at the back of the answer booklet

SECTION I: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Melanocytes have genetic instructions for insulin sequencing but they cannot synthesize it because: -

   A. The anatomical location of cell determine function

   B. The genes in the DNA determine functions

   C. Mutation determines functions of genes

   D. Suppressers and expressers in cell determine active genes

2. The likely explanation of a patient having dilutional hyponatremia after being infused with 5 % dextrose is: -

   A. Glucose is not osmotically active.

   B. 5 % dextrose is always hypotonic

   C. Sodium and glucose are co-transported.

   D. Glucose is metabolizable.

3. A patient present in the hospital with manifestation of numbness, tingling, pain during physical activity due to accumulation fats in the neuronal cells. The likely defective organelle is: -

   A. Smooth endoplasmic reticulum

   B. Ribosomes

   C. Lysosomes

   D. Centrioles

4. Single file flow occurs in: -

   A. Arteries

   B. Veins

   C. Ventricles

   D. Capillaries

5. A patient with renal disease has a dysfunctional handling of potassium leading to an increase in potassium levels in blood plasma. This is likely to increase: -

   A. Refractory period
   B. Hyperpolarization
   C. Repolarization
   D. Calcium efflux

6. The following electrolyte has a Nerst potential close to the resting membrane potential of excitable tissues : -

   A. Potassium
   B. Calcium
   C. Sodium
   D. Chloride

7. One of the following integral proteins is an example of primary active transport: -

   A. Sodium-Iodide symporter
   B. Sodium-Hydrogen Exchanger
   C. Shift of water molecules
   D. Hydrogen-Potassium ATPase

8. One of the following is an intracellular buffer : -

   A. Chloride
   B. Bicarbonate
   C. Phosphate
   D. Magnesium

9. Isotonic solutions : -

   A. Have higher osmolarity than blood plasma
   B. They have lower osmolarity than blood plasma
   C. 10 % Sodium Chloride is an example

D. Have same osmolarity as blood plasma

10. The mRNA translation: -
    A. Comes before transcription
    B. Takes place at granular endoplasmic reticulum
    C. Takes place at Golgi Body
    D. It is the final process of protein synthesis
11. Meiosis : -
    A. Take place only in somatic cell
    B. Results in two diploid cells
    C. Recombination of DNA material takes place
    D. Recombination of RNA
12. Clotting factor IV : -
    A. Is thrombin
    B. It is charismas factor
    C. It is calcium
    D. Needed in first step of intrinsic pathway
13. Classic Hemophilia: -
    A. It is more in females than male
    B. It is caused by a deficiency of factor VII
    C. Blood becomes more prone to clot formation.
    D. It is an X-linked recessive hereditary disorder
14. Electrical synapses are common in which of the following tissues : -
    A. Neurons
    B. Neuromuscular junction
    C. Retinal layers
    D. Brain
15. Mannitol is an important marker of: -
    A. Intracellular compartment
    B. Transcellular compartment
    C. Extracellular compartment
    D. Intravascular compartment

16. One of the following is an example of innate immunity: -
    A. B-cell
    B. T-cells
    C. CD-8 cells
    D. Microphage
17. Gaseous exchange takes place first in: -
    A. Terminal bronchioles
    B. Respiratory bronchioles
    C. Alveolar
    D. Trachea
18. Hyperventilation results in the following change in blood plasma: -
    A. Rise in oxygen carriage capacity
    B. Fall in p.H.
    C. Rise in p.H.
    D. Rise in carbon dioxide level
19. Dysfunction of the thymus will affect the maturity of: -
    A. B-cells
    B. Monocytes
    C. Neutrophils
    D. CD-4 cells
20. The third heart sound is caused by: -
    A. Closure of mitral and tricuspid valve
    B. Closure of mitral and pulmonic valve
    C. Rapid ventricular filling
    D. Slow ventricular filling

SECTION II: SHORT ANSWER QUESTIONS (30 MARKS)

1. State three (3) functions of mitochondria (3 Marks)
2. State five (5) components and function of cell membrane (5 Marks)
3. Outline five (5) the cells that are formed by colony lymphoid progenitor cells (5 Marks)
4. State five (5) functions of respiratory system (5 Marks)
5. Outline five (5) steps involved excitation-contraction coupling (5 Marks)
6. State five (5) components of conducting system of the heart (5 Marks)
7. Draw a labelled diagram of a typical nerve action potential and indicate the different phases (4 Marks)

SECTION III: LONG ANSWER QUESTION – (20 MARKS)

1. Feedback mechanism is essential in enhancing body equilibrium.
   a) Giving examples, explain Positive Feedback mechanism (10marks)
   b) Giving examples, explain Negative Feedback (10 marks)