



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCES  
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES  
END OF SEMESTER DECEMBER 2022 EXAMINATIONS**

**COURSE CODE AND TITLE: BSM 113/BSN 113 MEDICAL PHYSIOLOGY I**

**DATE: 15-DECEMBER-2023**

Duration: 2 HOURS

Start: 11:15 AM

Finish: 1:15 PM

**INSTRUCTIONS**

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (20 marks) Section II: Short Answer Questions (30 marks) and Section III: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

**SECTION I: MULTIPLE CHOICE QUESTIONS**

**(20 MARKS)**

1. Peripheral chemoreceptors are more sensitive to:-
  - A. Hypoxic drive
  - B. Hypercapnic drive
  - C. Protons
  - D. All of the above
2. Acute blood loss of more than 2 liters leads to a decrease in: -
  - A. Renin secretion
  - B. Total peripheral resistance
  - C. Firing rate of carotid and aortic baroreceptors
  - D. Aldosterone release.
3. One of the following is not affected by the pre-load
  - A. End systolic volume
  - B. End diastolic volume
  - C. Stroke volume
  - D. Cardiac output
4. One of the following is false regarding blood flow patterns in normal vessels: -
  - A. Lamina flow occurs in arteries and arterioles
  - B. Lamina flow occurs in vein and venules
  - C. Single file flow occurs in capillaries
  - D. Lamina flow is silent only in large-caliber vessels

5. One of the following protein molecules is important in smooth muscle contraction
- A. Troponin C
  - B. Troponin I
  - C. Calretinin
  - D. Calmodulin
6. Negative feedback system: -
- A. Blood clotting is an example
  - B. The stimulus and effector change the variable in the same direction.
  - C. It is viscous
  - D. Control of blood glucose is an example
7. Sodium-Hydrogen (NH) exchanger is an example: -
- A. Primary active transport
  - B. Secondary active transport
  - C. Facilitated diffusion
  - D. Osmosis
8. One of the following is the most abundant anion in blood plasma
- A.  $\text{Cl}^-$
  - B.  $\text{HCO}_2^-$
  - C.  $\text{Na}^+$
  - D.  $\text{Mg}^{++}$
9. One of the following is true about 5% d-glucose solution
- A. Can cause an increase in osmolarity of blood plasma
  - B. It is always isotonic to blood plasma
  - C. Can cause cellular swelling over time
  - D. Has osmolarity of 308 osmol/l
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. Which of the following is found during meiosis but not mitosis?
- A. Chromatids
  - B. Polar microtubules
  - C. Metaphase
  - D. Cross over
12. Clotting factor IV participates in stages of intrinsic clotting cascade except
- A. Formation of prothrombinase
  - B. Formation of tenase
  - C. The function of clotting factor VIII
  - D. Activation of clotting factor XII
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. Adequate stimulus for rods and cons is: -
- A. Heat energy
  - B. Pressure energy
  - C. Noxious stimulus
  - D. Electromagnetic energy
15. Mannitol is an important marker of:
- A. Intracellular compartment
  - B. Transcellular compartment
  - C. Extracellular compartment
  - D. Intravascular compartment
16. The primary cells that form Kupfer cells are located in: -
- A. Liver
  - B. Spleen
  - C. Bone marrow
  - D. Lymph nodes

17. Typical value of intrapleural pressure is \_\_\_\_\_ cmH<sub>2</sub>O
- A. +6
  - B. +3
  - C. -3
  - D. -6
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. Compare and contrast between peroxisomes and lysosomes (4 Marks)
2. List the major structural components of the cell membrane and illustrate how they are organized (5 Marks)
3. Name the cells that are formed by colony myeloid progenitor cells (5 Marks)
4. Explain how Ferguson Reflex is a positive feedback system (5 Marks)
5. Outline steps involved in the activation of Ryanodine receptors in the sarcoplasmic reticulum (4 Marks)
6. State three components of conducting system of the heart (3 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. Describe the cardiac cycle under the following subheading (20 Marks)
  - a) Diastole
  - b) Systole
  - c) Ejection fraction
  - d) Heart sounds