



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

**COURSE CODE: BSN 123/BSM 123 MEDICAL PHYSIOLOGY II**

**DATE: 15-DECEMBER- 2023**

Duration: 2 HOURS

Start: 9:00 AM

Finish: 11:00 AM

**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. The maternal growth hormone of pregnancy is: -
  - A. hGH-N
  - B. hCS
  - C. estriol
  - D. hCG
  
2. The blood-testis barrier is formed by a tight junction between: -
  - A. Leydig cells
  - B. Sertoli cells
  - C. Spermatids
  - D. Primary spermatogonia
  
3. The most abundant cell types in the islet of Langerhans synthesize and secrete
  - A. Glucagon
  - B. Somatostatin
  - C. Insulin
  - D. Incretin
  
4. One of the following substances is most permeable in the lipid bilayer in the absence of the integral protein
  - A. Na<sup>++</sup>
  - B. Urea
  - C. Glucose
  - D. Water

5. The resting membrane potential of ventricular cardiomyocytes is closest to the Nernst potential for: -
- A. Sodium
  - B. Chloride
  - C. Potassium
  - D. Calcium
6. Hypokalaemia would be expected to result in: -
- A. Increased neuronal excitability
  - B. A more negative resting membrane potential
  - C. No change in resting membrane potential
  - D. Decrease in firing level of neurons
7. In skeletal muscle, the thin filaments do not contain: -
- A. Myosin
  - B. Actin
  - C. Tropomyosin
  - D. Troponin
8. An increase in pericardial fluid from 50 ml to 500 ml is likely to cause one of the following types of shock: -
- A. Cardiogenic
  - B. Obstructive
  - C. Distributive
  - D. Haemorrhagic

9. The macular denser.
- A. Located in the renal pelvis
  - B. Located in the proximal convoluted tubule
  - C. Sensitive to increased blood pressure
  - D. Sensitive to tubular load of sodium chloride
10. The renal threshold for glucose is \_\_\_\_\_ of glucose in plasma.
- A. 160 mg/dl
  - B. 170 mg/dl
  - C. 10 mmol/l
  - D. 45 mmol/l
11. The tubule transport maximum (T<sub>max</sub>) of glucose in men is \_\_\_\_\_ mg/min
- A. 575
  - B. 180
  - C. 125
  - D. 375
12. The following will be the effect of blocking the activity of aldosterone
- A. Hyperkalemia
  - B. Hypokalemia
  - C. Hyponatremia
  - D. Fluid volume overload
13. Gastrectomy is likely to cause: -
- A. Reduced absorption of Vitamin B3
  - B. Microcytic anemia.
  - C. Reduced absorption of Vitamin B12
  - D. Aplastic anemia.

14. The normal glomerular filtration rate is \_\_\_\_\_ mls/minute
- A. 200
  - B. 150
  - C. 125
  - D. 80
15. In micturition reflex, the parasympathetic nervous system: -
- A. It is for emptying of the bladder
  - B. It is filling the bladder
  - C. Causes relaxation of detrusor muscle
  - D. Causes contraction of sphincter muscle
16. All are TRUE regarding the spread of cardiac potentials except: -
- A. Sinoatrial node excitation rate is 80 action potential per minute
  - B. AVN delay is approximately 100 msec.
  - C. Septal depolarization is from left to right
  - D. AVN delay allows the ventricles to fully empty their content
17. The greatest percentage of blood is found in the: -
- A. Heart.
  - B. Aorta.
  - C. Veins.
  - D. Capillaries.
18. 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 production.

19. The muscle spindle is not innervated by: -

- A.  $A\alpha$
- B.  $A\lambda$
- C. Ia fiber
- D. II fiber

20. Muller's doctrine of specific nerve energies is otherwise known as: -

- A. Bell- Magendie law
- B. Labeled-line principle
- C. Weber-Fechner law
- D. Law of projection

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**SECTION II: SHORT ANSWER QUESTIONS**

**(30 MARKS)**

1. Compare and contrast between cortical nephrons and juxtamedullary nephrons (5 Marks)
2. Explain the Frank Sterling Law of the heart (4 Marks)
3. Compare and contrast between direct and indirect pathways of Basal Ganglia (4 Marks)
4. Explain the regulations of gastric acid secretion (4 Marks)
5. Explain the role of insulin and glucagon in the homeostasis of glucose (4 Marks)
6. Highlight the four (4) components of pancreatic juice (4 Marks)
7. Name cardiac cycle phases shown in BC, CE, EA, AB and determine ejection fraction from volume- pressure loop of left ventricle below. (5 Marks)

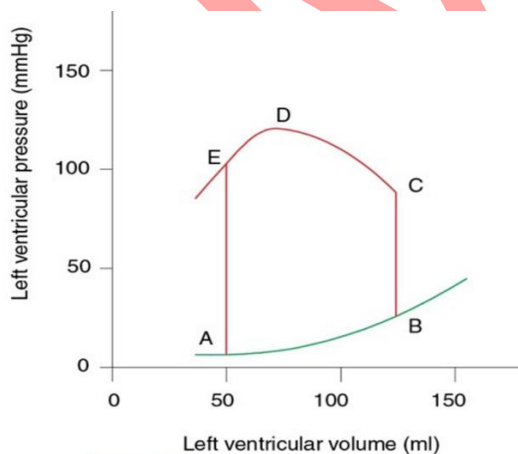


FIGURE 4.3-6 Pressure-volume loop of left ventricle.

**SECTION III: LONG ANSWER QUESTION –**

**(20 MARKS)**

1. Describe the neural circuits in both the heart and kidney as well as the endocrine functions of these two organs in regulation of the blood pressure. (20 Marks)