



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
BACHELOR OF SCIENCE IN NURSING (PRESERVIVE)
END OF TRIMESTER EXAMINATIONS AUGUST 2022**

UNIT CODE: BSN 113 UNIT NAME: MEDICAL PHYSIOLOGY 1

DATE: 28th July, 2022

TIME: 2 Hours

Start: 9:00 AM

Finish: 11:00 AM

INSTRUCTIONS

1. This exam is marked out of 70 marks.
2. This exam has three sections: Section A, section B and section C.
3. All questions are compulsory.
4. Answer all questions in the booklet provided.

SECTION A: MULTIPLE CHOICE QUESTIONS

(20 MARKS)

1. Negative feedback control:
 - A. Response always tends to correct an error that has already occurred
 - B. Errors are sometimes prevented
 - C. The controller has a variable set-point
 - D. Sensors are not essential
2. Concerning structure of receptors found on the cell membrane, they:
 - A. can't be saturated
 - B. are integral proteins
 - C. don't have a ligand binding domain
 - D. are hydrophilic molecules
3. After the peptide and tRNA are hydrolyzed during termination, the new polypeptide is released from the ribosome to:
 - A. Cytoplasm
 - B. Nucleus
 - C. Ribosome
 - D. Mitochondria
4. The name of the type of transport where glucose or an amino acid bind to a receptor protein on the plasma membrane, which then moves the molecule into the cell without the expenditure of energy is:
 - A. Facilitated diffusion
 - B. Bulk transport
 - C. Secondary active transport
 - D. Active transport
5. The bicarbonate buffer:
 - A. Is a physiological buffer
 - B. Is primarily an intra-cellular buffer
 - C. Is quantitatively less important than the protein buffer
 - D. Hyperventilation would tend to reduce the pH
6. Of the total body fluids, the interstitial fluid compartment constitutes about:

- A. 20 %
 - B. 15 %
 - C. 30 %
 - D. 5 %
7. Full thickness burns on the skin to more than 20 % of the body surface is life-threatening because of the:
- A. Fluid loss and inability to produce vitamin
 - B. Loss of ability to thermoregulate and infection
 - C. Inability to excrete lactic acid, urea, uric acid, loss of thermoregulation
 - D. Fluid loss and loss of the barrier against infection
8. The ion that has the greatest impact on the resting membrane potential is:
- A. Potassium
 - B. Sodium
 - C. Calcium
 - D. Chloride
9. The part of the human brain contains the major biological clock responsible for the regulation of circadian rhythms is:
- A. Brain stem
 - B. Thalamus
 - C. Hypothalamus
 - D. Midbrain
10. Severing the nerves that innervate the breathing muscles may lead rapidly to death. Will a spinal cord break between the level of cervical vertebrae 6 and 7 leave the victim able to breath?
- A. No. The breathing muscles are innervated by spinal nerves that leave the spinal cord at the level of each thoracic vertebra.
 - B. Yes. The diaphragm will work as it is innervated by nerves arising from C3 to C5.
 - C. No. The breathing muscles are innervated by autonomic impulses arising from the respiratory center which is located in the brain stem.
 - D. Yes. The muscles of breathing are innervated by the sympathetic nervous system which is unaffected by damage to the somatic nervous system.
11. The peripheral nervous system coordinates the increase of the heart rate in response to a fear-inducing stimulus. The correct sequence of neurotransmitters released in this process (preganglionic fibers, followed by postganglionic fibers) is:
- A. Only acetylcholine is released.
 - B. Acetylcholine is released by preganglionic fibers, while noradrenaline is released by postganglionic fibers.
 - C. Noradrenaline is released by preganglionic fibers, while acetylcholine is released by postganglionic fibers.

- D. Acetylcholine and noradrenaline are released by both preganglionic and postganglionic fibers.
12. A Rh+ donor can donate blood to the following recipient:
- A. Rh-
 - B. O-
 - C. AB-
 - D. B+
13. The second stage in blood clotting is:
- A. Activation of the coagulation cascade
 - B. Endothelial damage
 - C. Formation of platelet aggregates
 - D. Vascular stasis
14. The following events occur during early ventricular systole, the:
- A. Atria are relaxed, the ventricles are filling passively, the atrioventricular valves are open.
 - B. Ventricles are starting to contract, the atrioventricular valves are closed, the semilunar valves are closed.
 - C. Atria contract, the ventricles are relaxed, the atrioventricular valves are open.
 - D. Atria are relaxed, the ventricles are starting to relax, the atrioventricular valves are opening, the semilunar valves are closing.
15. One of the following is a vasodilator:
- A. Atrial natriuretic peptide
 - B. Angiotensin II
 - C. Epinephrine (adrenaline)
 - D. prostaglandins
16. The nurse is taking the client's blood pressure. The physician asks for the pulse pressure. To obtain the pulse pressure, the nurse will have to do which of the following things?
- A. Obtain a pulse-pressure machine
 - B. Subtract the diastolic blood pressure from the systolic
 - C. Subtract the systolic blood pressure from the diastolic
 - D. Take client's apical pulse and subtract it from systolic
17. The correct statement about baroreceptors is:
- A. They are located in the walls of the aortic arch and the inferior vena cava.
 - B. A drop in blood pressure triggers the baroreceptor reflex which causes vasodilation and an increased heart rate.
 - C. They promote vasoconstriction and an increased force of myocardial contraction in the hypotensive patient.
 - D. They respond directly to alterations in circulating oxygen level.
18. The respiratory center in the brain is sensitive to:
- A. An increase in H⁺ concentration in the CSF.

- B. A decrease in O₂ concentration in the blood.
- C. An increase in H⁺ concentration in the blood.
- D. A decrease in O₂ concentration in the CSF.

19. The following is NOT part of the respiratory membrane:
- A. The basement membrane of alveolar epithelial cells
 - B. The plasma membrane of red blood cells
 - C. Capillary endothelial cells
 - D. Alveolar fluid and surfactant
20. The term that is applied to the volume of air that moves into the lungs while breathing at rest is:
- A. Anatomical dead space
 - B. Inspiratory reserve capacity
 - C. Tidal volume
 - D. Residual volume

SECTION B: SHORT ANSWER QUESTIONS (30 MARKS)

1. Describe the process of DNA-RNA transcription, translational and replication as follows:
 - a. Transcription (3 marks)
 - b. Translation (3 marks)
 - c. DNA Replication (3 marks)
2. Outline five (5) examples of second messengers in the human cell and provide a function of each. (5 marks)
3. State the functions of the five (5) lobes of the cerebral cortex. (5 marks)
4. State five (5) types of white blood cells and how they provide immunity to the body. (5 marks)
5. Describe the process of carbon dioxide transport (6 marks)

SECTION C: LONG ANSWER QUESTION (20 MARKS)

1. The heart is a vital organ in the cardiovascular system and plays a key role in maintaining healthy functioning of all body organs:
 - a. State four (4) characteristics of cardiac muscle. (4 marks)
 - b. Describe the conduction system of the heart. (6 marks)
 - c. Describe the four (4) phases of the cardiac cycle. (10 marks)

THE END!

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