



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2019/2020
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
PHARMACY (BPharm Level I)

HMP 120: MEDICAL PHYSIOLOGY I

DATE: MONDAY 30TH NOVEMBER 2020

TIME: 11.00 A.M - 1.00 P.M

INSTRUCTIONS:

Answer **ALL** Questions

Section A: MULTIPLE CHOICE QUESTIONS (1 mark each)

Section B and C: Write your answer in the answer booklet.

1. The liquid portion of the blood with formed elements, clotting factors and proteins removed is known as:
 - A) plasma.
 - B) platelets.
 - C) plasma proteins.
 - D) serum.
2. Plasma consists of
 - A) about 55% of blood.
 - B) about 40% plasma proteins.
 - C) formed elements.
 - D) bone marrow.
3. Which of these leukocytes is an agranulocyte?
 - A) Basophil
 - B) Eosinophil
 - C) Neutrophil
 - D) Lymphocyte
4. Where does hematopoiesis of red blood cells and platelets take place in Adults?
 - A) Liver
 - B) Lungs
 - C) Spleen
 - D) Sternum
5. Intensive physical training can result in this condition:

- A) Severe Anemia
 - B) Secondary polycythemia
 - C) Hereditary Hemophilia
 - D) Acute Thrombocytopenia
6. Megaloblastic anemia can be caused by:
- A) Lack of iron in the body.
 - B) Lack of Vitamin B12
 - C) Severe Bleeding
 - D) Lack of Vitamin B 6.
7. What is the function of the hemoglobin in Red Blood Cells:
- a) To bind oxygen.
 - b) To aid in red blood cells reproduction.
 - c) To stabilize White blood cells.
 - d) To aid in hemostasis.
8. Erythropoietin stimulates:
- a) White blood cell production in the bone marrow.
 - b) Platelet production in the spleen
 - c) Blood pressure regulation in the kidneys
 - d) Red blood cell production in the red bone marrow.
9. Which of the following statements about granulocytes is **correct**?
- a) They fight infection.
 - b) They clot blood.
 - c) They lack a nucleus.
 - d) They are produced in the spleen.
10. The following cell is involved in the formation of Platelets:
- a) Melanocytes
 - b) Macrophages
 - c) Astrocytes
 - d) Megakaryocytes
11. The density of Na^+ channels is maximum at:
- a. Surface of myelin
 - b. Soma
 - c. Nodes of Ranvier
 - d. Dendrites
12. Sodium channels are specifically blocked by
- a. nifedipine
 - b. choline
 - c. tetraethyl lead
 - d. tetrodotoxin

13. The nerve fiber carrying which of the following sensation has maximum diameter
- pain
 - proprioception
 - temperature
 - touch
14. the width of the synaptic cleft is about:
- 10-20 nm
 - 10-20 μm
 - 40-100 nm
 - 40-100 μm
15. The inhibitory neurotransmitters:
- open Na^+ channels on the postsynaptic membrane;
 - depolarize postsynaptic membrane;
 - hyperpolarize postsynaptic membrane;
 - open Ca^{2+} channels on the postsynaptic membrane
16. Stimulation of sympathetic nerve to intestinal smooth muscle results in:
- Increase in muscle tension
 - Muscle relaxation
 - Increase in rhythmic muscle contraction
 - Increased secretions
17. Regarding Excitation- contraction coupling in the smooth muscle, the following statement is true:
- Requires presence of troponin
 - Sustained contraction occurs with high calcium concentration
 - Phosphorylation of actin is required for contraction
 - Presence of calcium is essential to cause muscle contraction
18. Immediate source of energy for the muscle is:
- ATP
 - creatine phosphate
 - Glucose
 - ADP
19. The function of tropomyosin in skeletal muscle include:
- binding to myosin during contraction
 - acting as a relaxing protein at rest by covering the binding sites on actin.
 - sliding on actin to produce shortening.
 - releasing Ca^{++} after propagation of action potential.

20. Digitalis increases myocardial contractility by:

- a. Inhibiting $\text{Na}^+\text{-K}^+$ ATPase in the myocardium
- b. Decreasing breakdown of CAMP
- c. Increasing formation of CAMP
- d. Activating protein kinase

21. Structure made of two or more tissues that work together

- a. Tissue
- b. Cell
- c. Organ
- d. Organ system

22. Which of the following shows the correct level of organization in living things?

- a. Tissue, cell, organ, organ system
- b. Cell, organ, organ system, tissue
- c. Tissue, cell, organ system, organ
- d. Cell, tissue, organ, organ system

23. Where is ribosomal RNA produced?

- a. golgi apparatus
- b. ribosomes
- c. nucleolus
- d. endoplasmic reticulum

24. What is the normal osmolarity (in mOsm/L) of plasma?

- a. 100 mOsm/L
- b. 200 mOsm/L
- c. 300 mOsm/L
- d. 400 mOsm/L

25. Which of the following tissues is the least hydrated?

- a. bone
- b. adipose tissue
- c. nervous tissue
- d. muscle tissue

26. Receptors for thyroid hormones are situated

- a. Outer layer of the cell membrane
- b. Inner layer of cell membrane
- c. Cell membrane
- d. Nucleus

27. Positive feedback mechanism

- a. Is useful in maintaining hormonal levels in blood

- b. Can lead to vicious cycle
- c. Regulates level of a substance in the body fluids
- d. Is the most common feedback mechanism in the body

28. Osmosis is

- a. The flux of water due to a transmembrane hydrostatic pressure gradient
- b. The passive transmembrane diffusion of solute
- c. The active transmembrane transport of solute
- d. The passive transmembrane diffusion of water

29. The intercellular connections having high permeability for ions are

- a. Desmosomes.
- b. Focal adhesions.
- c. Hemidesmosomes.
- d. Gap junctions

30. Of the following substances, the lipid bilayer is most permeable to:

- a. sodium
- b. urea
- c. glucose
- d. water

Section B: SHORT ANSWER QUESTIONS:(5 marks each)

- 1) Outline the structure and functions of Red Blood Cells.
- 2) Describe the role of Blood in Transportation.
- 3) Describe the protective role of Blood in the Body.
- 4) Describe the steps of gene expression.
- 5) Contrast the composition of body fluids in the Intra-cellular compartment (ICF) from the extra-cellular compartment (ECF)
- 6) Distinguish between the following membrane transport mechanisms: simple diffusion, facilitated diffusion, and active transport.
- 7) Outline the components of a negative feedback loop.
- 8) Outline the mechanism of excitation-contraction coupling in the skeletal muscle.
- 9) List any five factors affecting neuronal growth
- 10) Classify the Acetylcholine Receptors and their respective mechanism of action.

Section C:LONG ANSWER QUESTIONS. (10 MARKS EACH)

1. Discuss Hemostasis and the Coagulation Pathways
2. Discuss the Rh-rhesus blood group and its clinical significance during pregnancy
3. Describe any four types of inter-cellular communication

4. Elaborate on the effects of extracellular ionic changes (Na^+ , K^+ and Ca^+) on the resting membrane potential and action potential in a nerve.