



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

THIRD SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
MEDICINE AND BACHELOR OF SURGERY) (MB: CHB)

HMP I: MEDIAL PHYSIOLOGY I

DATE: WEDNESDAY 30TH AUGUST 2017

TIME: 9.00 A.M. - 11.00 A.M.

INSTRUCTIONS

1. Answer all questions in section A, B and C
2. Answer section A on this question sheet
3. Answer section B and C on the answer booklet provided

SECTION A

MULTIPLE CHOICE QUESTIONS - CHOOSE THE SINGLE BEST ANSWER

1. What causes the release of histamine in an allergic reaction?
 - A. Binding of IgM to basophils.
 - B. Binding of IgE to mast cells.
 - C. Release of histamine by helper T cells.
 - D. Free radical stimulation of endothelial cells
2. Which of the following blood units carries the least risk of inducing an immediate reaction in a type B, Rh+ patient?
 - A. Type A +ive whole blood.
 - B. Type O +ive whole blood.
 - C. Type AB +ive whole blood.
 - D. Type O +ive packed red cells.

3. The protein responsible for iron transport in plasma is
- A. Ferritin
 - B. Apo-transferrin
 - C. Apo-ferritin
 - D. Ceruloplasmin
4. Regarding Opsonization:
- A. It means neutralization of antigen by antibody
 - B. Antigen gets attached directly to the phagocyte receptor
 - C. Antibody makes a bridge between antigen & receptor
 - D. The antigen is surrounded by edges of cell membrane.
5. The most abundant cells of the blood are:
- A. Platelets.
 - B. Erythrocytes.
 - C. Leukocytes.
 - D. Reticulo-endothelial cells.
6. Cytoskeleton comprises of:
- A. Microtubules and microfilaments
 - B. Cell membrane
 - C. Golgi apparatus
 - D. Gap junctions
7. Tetrodotoxin blocks:
- A. Na^+ channel
 - B. K^+ channel
 - C. Ca^{++} channel
 - D. Cl^- channel

8. Agranular endoplasmic reticulum is involved in the synthesis of
- A. Protein
 - B. Lipids
 - C. Vitamins
 - D. Carbohydrates
9. junction that forms a barrier to the movement of ions from one cell to another is:
- A. tight junction
 - B. adherens junction
 - C. c. gap junction
 - D. d. desmosomes
10. Milieu interior is constituted by :
- A. Tissue fluid
 - B. Intracellular fluid
 - C. Blood
 - D. Plasma
11. Action potential:
- A. is a graded potential.
 - B. is produced by sub threshold stimulus.
 - C. starts with repolarization caused by outward movement of Cl^- .
 - D. is conducted slower in thin nerve fibers.
12. During depolarization:
- A. voltage activated Na^+ channels open.
 - B. the membrane becomes impermeable to Na^+ .
 - C. when membrane potential reaches -55 m.v Na^+ & K^+ fluxes occur at the same time.
 - D. K^+ ions diffuse outside.

13. Stimulation of sympathetic nerve to intestinal smooth muscle results in:
- A. Increase in muscle tension
 - B. Muscle relaxation
 - C. Increase in rhythmic muscle contraction
 - D. Increased secretions
14. Which is an amino acid neurotransmitter:
- A. Acetylcholine
 - B. Epinephrine
 - C. GABA
 - D. Dopamine
15. The function of tropomyosin in skeletal muscle include:
- A. binding to myosin during contraction
 - B. the binding sites on actin acting as a relaxing protein at rest by covering.
 - C. sliding on actin to produce shortening.
 - D. releasing Ca^{++} after propagation of action potential.
16. Excitation from SA node to AV node is conducted by:
- A. nodal fibers;
 - B. internodal fibers;
 - C. atrial cardiac cells;
 - D. Purkinje fibers;
17. Which ionic currents are responsible for depolarization in nodal cells?
- A. K^+ outward current;
 - B. Cl^- inward current;
 - C. Na^+ inward current;
 - D. Ca^{2+} inward current;

18. The parasympathetic effects on the heart can be explained by:
- A. increased permeability for K^+ ions in nodal cells;
 - B. increased threshold potential in nodal cells;
 - C. decreased permeability for K^+ ions in nodal cells;
 - D. increased permeability for Na^+ ions in nodal cells;
19. Second heart sound is caused by:
- A. ventricular relaxation;
 - B. closing of semilunar valves;
 - C. vibration of the aortic walls at the beginning of diastole;
 - D. vibration of atrial walls;
20. After-load causes the cardiac muscle to contract:
- A. Isometrically and tension in the increases gradually
 - B. Isotonically with shortening of muscle as a whole
 - C. Isotonically without shortening of muscle as a whole
 - D. Isometrically only
21. Baroreceptors of carotid sinus and aortic arch are sensitive to;
- A. increase in systolic pressure.
 - B. increase in venous pressure.
 - C. increase in pulse pressure.
 - D. increase in ventricular pressure.
22. Which mechanism is most effective in returning the BP back to normal:
- A. Baroreceptor reflexes
 - B. Chemoreceptor reflexes
 - C. Capillary fluid shift mechanism
 - D. Long-term BP regulatory mechanism

23. Blood brain-barrier is made up of:
- A. Astrocytes
 - B. Oligodendrocytes
 - C. Oligodendroglia
 - D. Microglia
24. Loss of upto 10% of total blood volume over the period of 20 minutes causes:
- A. Decreased BP, normal venous pressure (VP)
 - B. Decreased BP, decreased VP
 - C. Normal BP, normal VP
 - D. Normal BP, decreased VP
25. In brain ischemia, systemic blood pressure rises, this is called:
- A. Baroreceptor reflex
 - B. Cushing reflex
 - C. Bainbridge reflex
 - D. BezoldJarisch reflex
26. The largest portion of the arterial pressure gradient during systole is dissipated at which of the following locations in the vascular tree?
- A. Aortic arc
 - B. Arterial-arteriolar juncture
 - C. Arteriolar-capillar juncture
 - D. Capillary-venular juncture
27. Local autoregulatory mechanisms in CVS:
- A. Are chemical and neural types
 - B. Include vasoactive substances like prostaglandins and nitric oxide
 - C. Operate along with other mechanisms to adjust vascular responses throughout the body
 - D. Operate to maintain blood flow through an organ at relatively constant level

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- D. Microglia

29. The most powerful stimulus to initiate CNS ischaemic response is:

- A. CO₂ accumulation in the medulla
- B. Fall in arterial pO₂
- C. Rise in arterial pCO₂
- D. Fall in the blood pH

30. Nitric oxide:

- A. Also called endothelium derived relaxing factor
- B. Defficiency is associated with hypotensoin
- C. Produces smooth muscle relaxation throughout the body
- D. Helps formation of new blood vessels

SECTION B

SHORT ANSWER QUESTIONS

Write your answer in the space provided

Each question = 5 marks

1. List the different mechanisms of initiation of contraction of smooth muscle.

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SECTION B

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1. List the different mechanisms of initiation of contraction of smooth muscle.

2. Describe in detail any two factors affecting cardiac output.

3. List factors affecting venous return

4. With the aid of a diagram, describe the Starling's forces that affect movement of fluid at the capillary level

5. *Describe the post translational modification of proteins*

6. Using one example, describe positive feedback control process.

7. Enumerate any 5 functions of plasma proteins.

8. Describe the steps of hemostasis after vascular injury

9. List the factors regulating coronary blood flow

10. List any five endogenous anti-clotting factors or mechanisms.

SECTION C – LONG ANSWER QUESTIONS.

Answer all questions on the answer booklet provided (10 marks each)

1. Describe the various body fluid compartments and list the methods of measuring each.
2. Explain humoral and nervous regulation of blood pressure.
3. Describe the characteristic features of receptors of neurotransmitters
4. Explain how neutrophils destroy pathogens