Human Physiology 1 Exam 3

MEDICAL PHYSIOLOGY
SECTION A: MULTIPLE CHOICE QUESTIONS

1. In normal cardiac cycle:
a. Left atrial systole precedes right atrial systole
b. Right ventricular starts ejecting before left ventricular
c. Pulmonary valve closes before aortic valve
d. Right and left atrial systole occur simultaneously

2. In a normal heart at rest the end-systolic volume is:
a. 10 to 30 ml
b. 30 to 40 ml
c. 50 to 70 ml
d. 120 to 150 ml

3. The major cation in plasma part of blood is:
a) potassium
b) chloride
c) sodium
d) calcium

4. Auto regulation refers to:
a) Blood flow in relation to tissue metabolic activity
b) Maintainance of a constant blood flow in the tissues
c) Increased blood flow in relation to decreased blood flow
d) Parasymphatetci response to change in blood pressure

5. Passive transport involves:
a) endocytosis and phagocytosis
b) active transport and diffusion
c) pinocytosis and osmosis
d) osmosis and diffusion

6. The potential at which occurrence of action potential is inevitable is known as:
a) membrane potential
b) threshold potential
c) action potential
d) hyperpolarisation potential

7. Smooth muscle cells:
a) Consist of cross striations
b) Are under involuntary control
c) Are common in hollow viscera
d) Make up great mass of somatic musculature

8. In a neuron, non gated ion channels are commonly located:
a) Throughout the neuron
b) On soma
c) On dendritic spines
d) On axon terminals

9. The cross bridges of the sarcomere in skeletal muscle are made up
a) Actin
b) Myosin
c) Troponin
d) Myelin

10. The following is a function of Tropomyosin in a skeletal muscle:
a) Covering sites where myosin binds to actin at rest
b) Releasing calcium ions after initiation of a contraction
c) Sliding on actin to produce shortening
d) Binding to myosin during contraction

11. The following is an inhibitory neurotransmitter
a).Serotonin
b).Glycine
c).Glutamate
d).Acetylcholine

12. The following occurs at motor end plate during action potential propagation:
a). There is opening of calcium voltage gated calcium ion channels
b). Acetylcholine is degraded to choline and acetate
c). Acetylcholine is released by synaptic vesicles
d). Movement of Acetylcholine from postsynaptic to presynaptic membrane

13. The statement that is FALSE about volume of fluid compartment in the body is:
a). Extra-cellular fluid volume in an average adult is approximately 40 liters
b). Intra-cellular fluid volume in an average adult is approximately 28 liters
c). Interstitial fluid volume in an average adult is approximately 10.5 liters
d). Plasma volume in an average adult is approximately 3.5 liters

14. Which cation is mostly found in the plasma?
a). Na+
b). K+
c). Ca2+
d). Mg2+

15. Plasma/cell membranes:
a). Are composed primarily of lipids
b). Lipid component consists of phospholipids, cholesterol, glycolipids and transporters
c). Peripheral proteins often span it
d). Cholesterol has a rigid structure that stabilizes the cell membrane and reduces the natural mobility of the complex lipids in the plane of the membrane

16. The type of microglia responsible for myelin formation around axons in the CNS is:

a). Oligodendrocytes
b).Schwann cells
c). Fibrous astrocytes
d). Protoplasmic astrocytes

17. Which of the following statement is FALSE about ion channels?
a). Ligand-gated ion channels are directly or indirectly activated by chemical neurotransmitters binding to membrane receptors.
b). Non gated ion channels are responsible for the influx of Na+ and efflux of K+ when the neuron is in its resting state.
c). In ligand-gated ion channels, receptors do not form part of the ion channel or may not be coupled to the channel via a G protein and a second messenger
d). Voltage-gated ion channels are sensitive to the voltage difference across the membrane.

18. Troponin:
a). Is a complex of three globular proteins (troponin T, troponin I, and troponin C) located at regular intervals along the tropomyosin filaments
b). is a filamentous protein that runs along the groove of each twisted actin filament.
c). At rest, its function is to block the myosin-binding sites on actin.
d). Is a globular protein and has myosin-binding sites.

19. I bands:
a) Are located on either side of the A band and appear light when viewed under polarized light.
b). They do not contain the thin (actin) filaments, intermediate filamentous proteins, and Z disks. They have thick filaments.
c). Are darkly staining structures that run down the middle of each I band, delineating the ends of each sarcomere.
d). Is located in the center of each sarcomere

20. Which of the following is NOT a characteristic of smooth muscle?
a) Are arranged in circular layers around hollow organs and blood vessels
b).Its cells are spindle shaped.
c).The actin-myosin myofilaments are not arranged into sarcomeres.
d). Its sarcoplasmic reticulum is tightly arranged within the cells, and they have T tubules

SECTION B: SHORT ANSWER QUESTIONS (40 MKS)

1. Describe the activities involved at the neuro-muscular junction during transmission of of an impulse (8mks)
2. Explain four difference between a cardiac muscle and skeletal muscle (8 marks)
3. Draw a diagram to illustrate fluid mosaic model of a plasma membrane (8 mks)
4. Describe mechanical events that occurs on the heart, after electrical events have taken place (8 mks)
5. Describe the ionic basis of resting membrane potential (8 mks)

SECTION C: LONG ANSWER QUESTIONS (40 MKS)

1. Describe coronary and cerebral blood circulation (20 mks)
2. Describe Excitation-Contraction Coupling in smooth Muscle (20 mks)