Kafrelsheikh University
Faculty of medicine
Physiology department

First year Physiology Exam
Time: Three hours
9/6/2018

Answer the following questions ? (each question in separate page)

I- BLOOD (15 marks)

Q1) Enumerate the following? (10 marks)

A- Natural anticoagulants. b- Types and functions of leucocytes.

Q2) Compare between different types of plasma proteins? (5 marks)

II- AUTONOMIC NERVOUS SYSTEM (15 marks)

Q1) Autonomic ganglia: definition, types, functions and properties? (10 marks)

Q2) pelvic nerve: origin, relay and functions? (5 marks)

III- NERVE& MUSCLE (15 marks)

Q1 Explain the following? (10 marks)

A- Conduction in unmyelinated nerve fiber.

B- Effects of denervation of skeletal muscles.

Q2) Draw and label strength-duration curve and its significance? (5 marks)

IV- RESPIRATORY SYSTEM (20 marks)

Q1) Mention the following? (10 marks)

A- Hering-Breuer reflex B- Significance of residual volume

C- Causes of hypoxic hypoxia D- Carriage of tidal CO_2

Q2) Discuss pulmonary function tests? (10 marks)

V- CARDIOVASCULAR SYSTEM (30 marks)

Q1) Mention the following? (10 marks)

A- The ionic bases of slow response action potential of the heart & explain the effect of sympathetic stimulation on it?

B- Respiratory sinus arrhythmia

Q2) what's the relation between the cardiac output and the venous return& mention the effect of respiratory movements, gravity and diameters of blood vessels on the venous return to the heart? (10 marks)

Q3) define the following pressures: arterial blood pressure, pulse pressure and mean arterial pressure& discuss intermediate term regulation of arterial blood pressure? 2 mechanisms only (10 marks)

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(VI) Choose the most correct answer and put your answer in answer sheet table? (30 marks)

1- Propagation of the action potential through the heart is fastest in the

A. SA node B. Atrial muscle C. AV node D. Purkinje fibers

2- The cause of Phase 2 = A plateau is.

A) Opening slow Ca2+ channels with slow opening of K+ channels.
B) Closure of Na+ channels
C) Closure of slow Ca2+ channels.
D) Activation of Na+ K+ pump

3- The greatest percentage of blood volume is found in the

A. Venules and veins B. Aorta
C. Distributing arteries and arterioles D. Capillaries

4- The "a" wave in jugular venous pulse:

A) Decrease "a" wave amplitude in tricuspid stenosis.
B) Negative wave.
C) Its ascending limb is due to atrial diastole.
D) Its ascending limb is due to atrial systole.

5- The cardiac index (CI):

A) C.O.P / body surface area. B) About 5 liters/m2/ min.
C) C.O.P / body weight. D) C.O.P / body height

6- The ejection fraction equals

A) 0.50 B) 0.55 C) 0.60 D) 0.65

7- The triple response

A) The red line is due to arteriolar dilatation
B) Spreading flare is due to capillary dilatation
C) The red line is due to capillary dilatation.
D) The red line is nervous in nature.

8- Vasomotion:

A) As a result of rhythmic contraction and relaxation of the meta-venules.
B) It is a normal phenomenon
C) Means continuous opening of the capillaries.
D) It always indicates serious disease

9- The diastolic pressure equals

A) 0 mmHg B) 5 mmHg C) 70 mmHg D) 90 mmHg

10- Closure of aortic valve occurs at the onset of which phase of cardiac cycle?

A) Isovolumetric contraction B) Rapid ejection
C) Protodiastole D) Isovolumetric relaxation

11 During exercise, there is an increase in a person's

A) Stroke volume B) Diastolic pressure
C) Venous compliance D) Pulmonary arterial resistance

12- An ectopic extrasystole caused by a ventricular focus is characterized by

A) Interruption of the regular SA node discharge

B) Retrograde conduction of action potential to the atria

C) A missed ventricular contraction

D) A missed atrial contraction

13- The enzyme ultimately responsible for the formation of fibrin is

A. Heparin B. Plasminogen C. Thrombin D. Prothrombin

14- Warfarin is an anticoagulant that is often given to patients following a heart attack. However, if too much warfarin is administered, the patient can have episodes of bleeding. The bleeding produced by warfarin can be overcome by administering

A. Aspirin B. Heparin C. t-PA D. Vitamin K

15- The RBC membrane

A) Its biconcave shape provides a maximum surface area for gas exchange

B) It is impermeable to anions.

C) It is plastic so preventing changes in the shape and size of cell.

D) It is freely permeable to cations.

16- Neutrophils

A) They constitute about 60% of the total WBCs count.

B) Each neutrophil can phagocytose 5 – 20 bacteria before it dies.

C) They are potent phagocytes

D) All of the above

17- Rhesus antigens

A) Rh antibodies are found naturally in the plasma

B). Presence of D (individual is Rh+ve) 15 % of the population

C) Clinically most important is D.

D) Clinically most important is E

18- Complement system

A) It is a system of 20 plasma proteins

B) Present in inactive form

C) Organized in cascade.

D) All of the above

19- Bleeding time is determined by nicking the skin superficially with a scalpel blade and measuring the time required for hemostasis. It will be markedly abnormal (prolonged) in a person who

A) Lacks factor VIII B) Cannot absorb vitamin K

C) Has liver disease D) Takes large quantities of aspirin

20- Citrate is a useful anticoagulant because of its ability to

A) Buffer basic groups of coagulation factors B) Bind factor XII

C) Bind vitamin K D) Chelate calcium

21- Improper maturation of the red blood corpulses can be caused by:

A) Vitamin B12 deficiency. B) Hypoxia.

C) Iron deficiency. D) Destruction of bone marrow.

22- All the following conditions cause anaemia EXCEPT:

A) Erythroblastosis fetalis. B) Destruction of the bone marrow.
C) Vitamin B12 deficiency. D) Living at high altitudes.

23- Increased activity of the sympathetic nervous system causes

A) Penile erection B) Pupillary constriction
C) Accommodation for near vision D) Bronchiolar dilation

24- Norepinephrine will cause contraction of the smooth muscle in the

A) Bronchioles B) Pupils C) Intestine D) Arterioles

25- Sympathetic nervous system:

A) Works in stress conditions.
B) Thoraco-lumbar outflow.
C) Catabolic system
D) All of the above.

26- Stimulation of lesser splanchnic nerve causes:

A) Micturition. B) Defecation. C) Ejaculation. D) Erection.

27- True cholinesterase

A) Nonspecific.
B) Present in nervous tissue & red blood cells.
C) Present in liver, spleen & plasma.
D) All of the above.

28- Concerning the autonomic ganglia, all the following is true EXCEPT:

A) They acting as distributing centers.
B) They are 3 types.
C) Their chemical transmitter is acetylcholine.
D) Their receptors are specifically blocked by atropine.

29- The following reflexes are all autonomic EXCEPT:

A) Salivary secretion. B) Micturition.
C) Flexion of the arm following a painful stimulus. D) Defecation.

30- Among symptoms of horner's syndrome there is:

A) Increased sweating.
B) Dilatation of pupil.
C) Dropping of the upper eye lid.
D) Vasoconstriction of skin blood vessels.

Oral exam:

- **From number 1 till 100 after written exam**
- **From number 101 till the end of list at Sunday 10/6/2018**