PSL301 Term Test 1 2017
Form A
Name_____Student Number_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Each question is worth 1 mark.

1) The AV node is important because it _____.
   A) directs electrical impulses from the ventricles to the atria
   B) electrically opens the AV valves
   C) delays the transmission of the electrical impulses to the ventricles in order for the atria to finish contracting
   D) serves as the pacemaker in a normal heart

2) The fibrous skeleton of the heart is important because it:
   A) Helps guide the blood into the proper chambers in sequence.
   B) Transmits electrical activity from the atria to the ventricles.
   C) Directs the flow of blood into the arteries.
   D) Forces electrical activity to be conducted through the atrioventricular node.

3) Tom suffers from hypertension (high blood pressure). Which of the following might help deal with his problem? A drug that:
   A) Blocks beta receptors in cardiac muscle tissue.
   B) Stimulates α_1 receptors in cardiac muscle tissue.
   C) Stimulates cAMP formation in cardiac muscle tissue.
   D) blocks muscarinic receptors in cardiac muscle tissue.

4) Which one of the following correctly lists factors that are all activated by thrombin?
   A) Factor V, Factor VII, Factor IV
   B) Factor XII, Factor IX, Factor XIII
   C) Factor VIII, Factor XI, Factor XIII
   D) Factor VII, Plasminogen, Tissue Factor

5) In order to cause vasodilation of most vascular smooth muscle, _____.
   A) norepinephrine combines with β_1 receptors
   B) sympathetic stimulation is removed
   C) acetylcholine combines with muscarinic receptors
   D) norepinephrine combines with alpha receptors

6) In which of the following conditions would you expect to observe an increase in reticulocytes in the blood?
   A) Non-athlete living at sea level who received a blood transfusion a month ago
   B) Athlete living at sea level
   C) Athlete who moves from sea level to a city at 1500m above sea level
   D) Athlete living in a city at 1500m above sea level

7) Which of the following is NOT directly triggered by exposed collagen in an injured blood vessel?
   A) Binding of von Willebrand factor
   B) Initial vascular spasm
   C) Platelet aggregation
   D) Activation of factor XII

8) Each of the following changes will result in increased blood flow to a tissue EXCEPT one. Identify the exception:
   A) Increased blood pressure
   B) Decreased vessel diameter
   C) Relaxation of precapillary sphincters
   D) Increased blood volume

9) Ivabradine selectively blocks I_f channels in the heart. Which statement would be true concerning a patient who is taking this drug?
   A) The amount of calcium entering the patient's heart cells would increase.
   B) This drug would raise the blood pressure of the patient.
   C) The drug would slow down this individual's heart rate.
   D) This drug would decrease contractility of the patient's heart.

10) Which of the following is an example of passive immunity?
   A) Transfer of antibodies from the mother to the fetus via the placenta
   B) Activation of memory T cells upon subsequent exposure to a bacterium
   C) Secretion of antibodies from plasma cells in an individual
   D) Vaccination against influenza using a component of the virus

11) The matching of blood flow to the changing metabolic needs of a tissue is due to _____.
   A) lymphatic system control
   B) hormonal control
   C) neural control
   D) local control

12) Which type of cell responds to viral infections but not to infections caused by extracellular bacteria?
A) B cells
B) Cytotoxic T cells
C) Helper T cells
D) Macrophages

13) If the connection between the AV node and bundle of His becomes blocked, _____.
A) the ventricles will beat more slowly
B) the ventricles will beat faster
C) the stroke volume will increase
D) the ventricular rate of contraction will not be affected

14) You do an agglutination test on the blood of four individuals, testing them both as donors and as recipients (i.e., Donor 1 is also Recipient 1). The results of the test are shown below, with '-' indicating absence of agglutination and '+' the presence of an agglutination reaction. Given that Individual 1 has type B blood and all individuals are Rh+, which one of the following statements is correct?

	Donor 1	Donor 2	Donor 3	Donor 4
Recipient 1	-	+	-	+
Recipient 2	+	-	-	+
Recipient 3	+	+	-	+
Recipient 4	-	-	-	-

A) Individual 2 has type A blood and anti-B antibodies
B) Individual 3 has type B blood and anti-A antibodies
C) Individual 2 has type O blood and anti-A and anti-B antibodies
D) Individual 3 has type AB blood and neither anti-A nor anti-B antibodies

15) In a normal infection with human papilloma virus, the virus infects cells that are in the superficial layer of the skin but it does not enter the circulation. What are the first immune cells that the virus would encounter in the skin?
A) Neutrophils and natural killer cells
B) B and T lymphocytes
C) Macrophages and dendritic cells
D) Macrophages and neutrophils

16) Put these phases of the cardiac cycle in the correct order:

1. opening of the semilunar valves
2. isovolumic contraction
3. beginning of atrial systole
4. closure of the AV valves
5. completion of ventricular filling
6. beginning of ventricular systole
7. ventricular relaxation
8. ventricular ejection

A) 3, 5, 6, 1, 8, 4, 2, 7
B) 3, 2, 6, 4, 5, 8, 7, 1
C) 3, 2, 6, 1, 4, 5, 8, 7
D) 3, 5, 6, 4, 2, 1, 8, 7

17) Imagine that you are working at a vaccine company and you have been asked to develop a vaccine against tapeworms (a gut parasite). Based on your knowledge of different classes of immunoglobulins and their function, which class of antibody would you want to ensure that the vaccine generated?

A) IgE
B) IgG
C) IgA
D) IgD

18) During ventricular systole, _____.

A) the atria are contracting
B) blood is entering the ventricles
C)) the ventricles are relaxed
D) the AV valves are closed

19) The driving force for blood flow is a(n) _____ gradient.

A) volume
B) pressure
C) gravity
D) osmotic

20) Which of the following correctly matches the cell to it main function?

A) Eosinophil: most abundant leukocyte; phagocytic; lives 1-2 days
B) Helper T cell: releases perforins to attack and kill infected host cells
C) Dendritic cell: phagocytose antigens and then migrate to lymphoid tissues
D) Neutrophil: precursor of macrophages; relatively rare in blood smears

21) If blood pressure doubled at the same time that the peripheral resistance doubled, the blood flow through a vessel would be:
A) 8 times greater
B) Unchanged
C) 1/8 as much
D) Doubled

22) Which scenario would result in the activation of a natural killer cell?
A) NK cell bound to target cell via both the activation and inhibition receptor
B) NK cell bound to target cell via its MHC class I and antigen receptor
C) NK cell bound to target cell via the T cell receptor and MHC class I and antigen
D) NK cell bound to target cell via activation receptor only

23) The end of the plateau phase is due to the _____ of Ca^{2+} channels and _____ of K^{+} channels.
A) opening, closing
B) closing, closing
C) closing, opening
D) opening, opening

24) Edie decides to take an antihistamine which blocks the action of histamine throughout her body. Imagine that she subsequently gets a cut when she is out gardening. Which physiological response to the injury would likely be directly reduced or inhibited as a result of the antihistamine?
A) Vasodilation at the site of injury
B) Release of histamine from mast cells
C) Phagocytosis of invading bacteria by macrophages
D) Release of interleukin-1 by macrophages

25) Put these autorhythmic cells into the correct order for conveying electrical signals through a normal heart.
1. bundle of His
2. internodal pathway
3. Purkinje fibers
4. atrioventricular node
5. sinoatrial node
6. left and right bundle branches

A) 5, 2, 4, 1, 6, 3
B) 5, 4, 1, 6, 2, 3
C) 5, 2, 1, 6, 4, 3
D) 4, 2, 5, 1, 6, 3

26) Use the following scenario to answer this question and questions 27) and 28). Monday morning, Jane, a healthy 22 year-old student, got out of bed quickly and took three steps toward her dresser before she collapsed. She woke up several seconds later still in in a prone position on the floor feeling slightly dazed. Upon telling her doctor, he measured her blood pressure and found that she is at the low end of the normal spectrum (95mmHg/65mmHg).

Based on the information provided above, what was the most likely explanation for Jane's fall?

A) Hypovolemic shock
B) Peripheral edema
C) Orthostatic hypotension
D) Heart attack

27) All of the following events EXCEPT ONE occurred in Jane's body shortly after her standing up. Identify the exception:

A) Carotid and aortic baroreceptors increased their action potential firing rates
B) Gravity caused pooling of blood in her lower extremities
C) Mean arterial pressure decreased
D) Cardiac output decreased from 5 L/min to about 3 L/min

28) Jane's baroreflex response was not sufficient to prevent her from fainting. For most people who stand up, all of the following reflex events EXCEPT ONE protect us from fainting by quickly restoring our mean arterial blood pressure levels to normal (within 2-3 heart beats) after standing. Identify the exception:

A) Increased norepinephrine binding to alpha receptors in the veins and arterioles
B) Increased potassium efflux from SA node myocytes
C) Increased cAMP production and calcium uptake in the SR of ventricular myocytes
D) Increased I_f current in SA node myocytes

29) Jessica has developed anemia due to inadequate iron in her diet. What would you expect to observe in comparison to a woman of the same age with a normal diet?

A) Higher hematocrit
B) Higher levels of ferritin in her liver
C) Larger erythrocytes
D) Higher levels of circulating erythropoietin

30) How is the soft platelet plug transformed into a firm clot during hemostasis?

A) Plasminogen cleaves prothrombin to form a meshwork of fibers
B) Thrombin cleaves fibrinogen to form a meshwork of fibers
C) Thrombin cleaves plasminogen to form a meshwork of fibers
D) Fibrinogen cleaves plasminogen to form a meshwork of fibers

31) Edema is likely to occur when _____.

A) blood hydraulic pressure at the capillary decreases
B) the concentration of protein in the blood increases
C) hemorrhage occurs
D) the heart becomes an insufficient pump