Name: _____

1	21	41
2	22	42
3	23	43
4	24	44
5	25	45
6	26	46
7	27	47
8	28	48
9	29	49
10	30	50
11	31	51
12	32	52
13	33	53
14	34	54
15	35	55
16	36	56
17	37	57
18	38	58
19	39	59
20	40	

Mark all your answers on this page. Nothing marked on the test pages will be graded. All questions should have only one answer unless the particular question specifies differently. Each letter is worth one point unless noted otherwise by the question.

1. Which of the following are components normally found in blood? Select ALL that apply.

A	Bubbles	F	Leukocytes
B	Plasma	G	Dartocytes
C	Synovial fluid	H	Vaderocytes
D	Dishlets	I	Leerythrocytes
E	Platelets	J	Erythrocytes

2. Where do most blood cells originate from?

A Bloodoblasts
B Axillary region
C Brain
D Acromial region
E Bone marrow

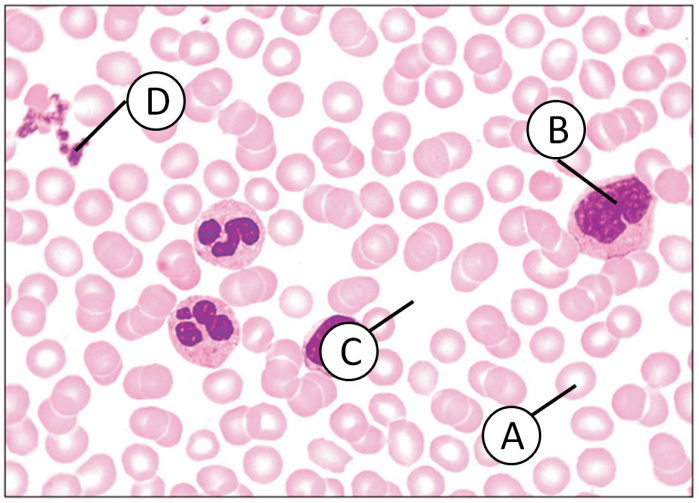
Questions 3-6 refer to the image to the right. Use the lettered notes to identify

3. Which selection points to an erythrocyte?

4. Which lettered area points to a leukocyte?

5. Which lettered area points to a complete cell?

6. Which lettered area points to a platelet?



7. How many mitochondria would you expect to find in a mature erythrocyte (just the broad range)?

A 0
B 10
C 100
D 1,000
E Millions and millions

8. Which term best describes the name of the general blood cell formation process that forms all formed elements of the blood?

A Hematopoiesis
B Hematocrit
C Bloody genesis
D Hemocytosis
E Hematocytosis

9. What is the difference between a reticulocyte and an erythrocyte?

A One is part of the pulmonary circuit, the other is part of the systemic circuit.
B One contains hemoglobin, the other does not.
C Muscles attach to reticulocytes but not erythrocytes.
D The presence of absence of ribosomes.
E The presence or absence of mitochondria.

10. The ability of blood to carry oxygen is regulated by a homeostatic mechanism. Specifically, a population of cells in the kidney sense low oxygen levels. In response, they release a substance known as EPO. EPO acts directly to increase the number of RBCs, resulting in an enhanced ability of blood to carry oxygen. Which of the following best describes the type of homeostatic mechanism used.

A Positive
B Neutral
C Negative
D Imaginary
E Hyperbolic

11. What is the name of the process that leukocytes use to leave a blood vessel?

A Unipedesis
B Diapedesis
C Triapedesis
D Triathapedesis
E Diathapedesis

For questions 12-15, select the best choice among the lettered choice on the right to answer the question.

12. Select the FIVE types of white blood cells below and put them in ORDER from most abundant to least abundant in a normal healthy human.

13. Which type of cell will form into a macrophage as it enters a tissue?

14. What do megakaryocytes form?

15. Which type of cell plays a pivotal role in the first steps after a blood vessel ruptures?

A Eosinophil
B Earlyophil
C Emeryophil
D Leukocyte
E Lymphocyte
F Leakyocyte
G Monocyte
H Milkocyte
I Biocyte
J Basophil
K Thermophil
L Neutrophil
M Protophil
N Platelets
P Erythocyte
Q Agranolacyte
R Granlacyte
S Meuocyte

16. While visiting Manhattan, you eat a hot dog from a street vendor. You of course also ingest several species of parasitic worms. Despite the fact that these worms are too large to be engulfed by phagocytosis, like bacteria can be, you do not eventually host a large family of worms. Which of the following best describes what likely happened?

A You got de-wormed after your trip to Manhattan, as is customary after visiting any large city.
B The car exhaust numbs most organisms, allowing them to be safely digested by your stomach acid.
C Emeryophils digested the worms.
D Eosinophils digested the worms.
E A barrage of erythrocytes knocked out the worm when they entered a blood vessel.

Questions 17-21 refer to the image to the right.

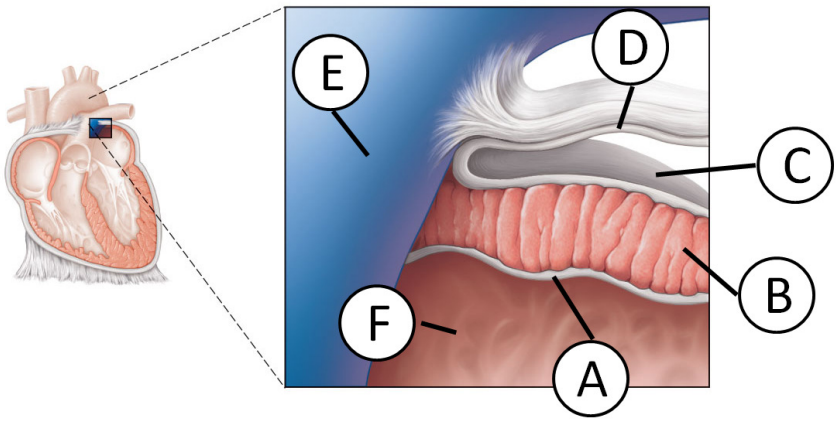
17. Which structure is continuous with the endothelial lining of blood vessels?

18. Which structure is myocardium?

19. Which structure is epicardium?

20. Which structure is endocardium?

21. Which structure corresponds to the visceral serosa?



Answer questions 22-27 using the lettered choices on the right.

22. What is the name of the valve between the left ventricle and left atrium?

23. What is the name of the valve between the pulmonary veins and the left atrium?

24. What is the oxygenation state of blood in the pulmonary veins?

25. What is the oxygenation state of blood in the aorta?

26. What is the oxygenation state of blood in the left atrium?

27. What is the oxygenation state of blood in the right atrium?

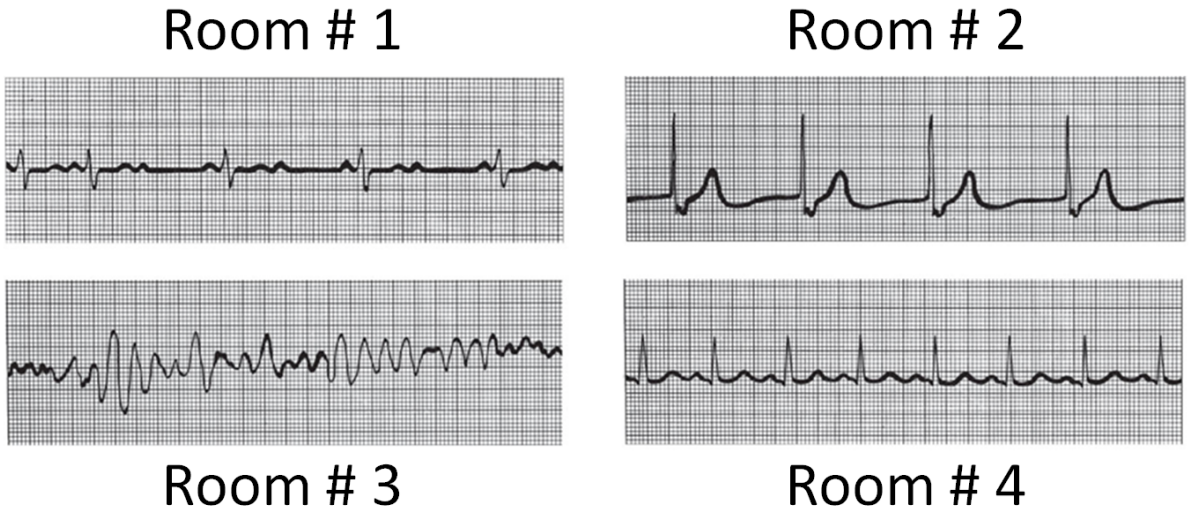
A. Oxygenated
B. Papillary muscle
C. Deoxygenated
D. Aorta
E. Superior vena cava
F. Pulmonary artery
G. Inferior vena cava
H. Pulmonary vein
I. Corondary sinus
J. Doesn't exist
K. Tricuspid valve
L. Bicuspid valve

28. You are talking to a nature-inclined friend of yours. He tells you that in forestry there is a term used to describe the presence of objects in a tree canopy that can fall and seriously hurt or kill people. He tells you this term is "widowmaker". Having taken a class in human anatomy, you immediately remember that this term is used to describe a particular blood vessel that, when occluded, causes a catastrophic infarction. What is the name of this vessel?

A Superior vena cava
B Inferior vena cava
C Left coronary artery
D Right coronary artery
E Right atrium

29. Which factor plays the greatest role in the function of valves located between ventricles and arteries?

A Smooth muscles contract, causing the valves to close
B Smooth muscles relax, causing the valves to close
C The shape of the valves and blood flow
D The resistance present in the total system circulation
E The presence of sodium dissolved in the blood



30. You are a nurse working a swing-shift at a cardiac intensive care-unit. The image above is a snapshot of the computer screen in front of you. It displays the running EKG results from four patients under your care who recently had heart surgery. When you glance at this screen, you suddenly get up and run somewhere. Where are you going <u>and</u> what are you bringing? Select TWO choices.

Destination	Equipment you are bringing
A. Room # 1	F. S resuscitator
B. Room # 2	G. QRS resuscitator
C. Room # 3	H. QRA resuscitator
D. Room # 4	I. Defibrillator
E. Home	J. Wallet

31. In a blood vessel, which layer would you expect to find smooth muscle?

A Tunica intima
B Tunica media
C Tunica externa
D Lumen
E Tunica lumina

32. You have become an erythrocyte that has just been pumped out of the right ventricle. Put the following terms in the order that you visit them until you end up back in the right ventricle. Use all the terms. If you get all of the structures in the right order, you get 5 points. If you mix up even one, you get zero. This is all-or-nothing!

A Alveoli
B Aorta
C Arteriole
D Large vein
E Left atrium
F Left ventricle
G Metarteriole
H Pulmonary artery
I Pulmonary vein
J Right atrium
K Small vein
L Thoroughfare channel
M Venule

Optional, but be careful. Circle the structures when RBCs are oxygenated. If you circle all of the correct structures, you get five extra credit points. If you do not circle <u>all</u> of the correct choices, you get zero points for the *entire question*. If you circle even one incorrect choice, you get zero points for the *entire question*. Do not circle anything unless you are confident that you know the answer. If you circle even one thing incorrectly, you will get zero points on question 32, even if the order is correct!

Answer questions 33-35 using the lettered choices on the right. **33. Select the THREE structural classes of capillaries and ORDER them from most to least permeable.** **34. Which types of capillaries can a water-soluble molecule go through passively? Select ALL that apply.** **35. Which types of capillaries can a really large molecule go through passively? Select ALL that apply.**	A Continuous B Leaky C Windowed D Fenestrated E Cuboidal F Sinusoidal

36. Select the THREE important sources of resistance to blood flow circulating through your blood vessels. Circle the factor that frequently changes.

A	Blood opacity	E	Total blood vessel length
B	Blood viscosity	F	Diameter of the aorta
C	Blood vessel diameter	G	How hard you are thinking
D	Cholesterol levels	H	The number of dishlets in your blood

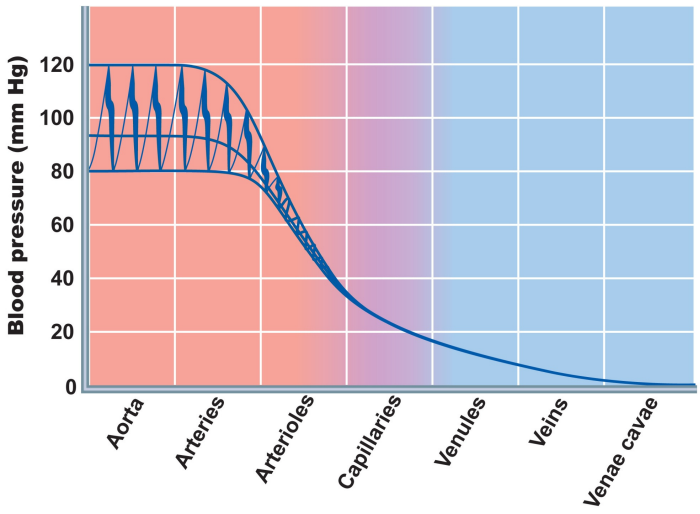
For question 37 and 38, use the image on the right to help you answer the question.

37. What best explains why blood pressure decreases significantly in the arterioles?

A. Diapedesis.
B. They are far from the pumping heart.
C. The diameter of the vessel is small.
D. The platelets accumulate and form a plug.
E. The dishlets accumulate and form a plug.

38. What best explains why the rate of blood pressure decrease eases off in the venules and veins?

A. Amoeboid movement.
B. They are getting sucked into the heart.
C. The diameter of the vessel is large.
D. The geniglossus contracts.
E. Swallowing changes the air pressure.



39. Baroreceptrs help regulate blood pressure by responding to being stretched in a blood vessel wall. Which of the following best describes their long-term role in regulating blood pressure.

A	They dilate vessels when blood pressure is high and can maintain a constant pressure for years.
B	They dilate vessels when blood pressure is low and can maintain a constant pressure for years.
C	They constrict vessels when blood pressure is high and can maintain a constant pressure for years.
D	They constrict vessels when blood pressure is low and can maintain a constant pressure for years.
E	They quickly adapt and are useless in the long-term.

For questions 40-45, identify whether the structure would be classified as part of the respiratory zone or the conducting zone.

A. Respiratory zone
B. Conducting zone

40. Nose
41. Alveoli
42. Trachea
43. Bronchi
44. Pharynx
45. Bronchiole

46. What THREE terms best describe the predominant type of epithelia located throughout the nasal cavity.

A Simple
B Pseudo-stratified
C Stratified
D Ciliated
E Axonemal
F Squamous
G Cuboidal
H Columnar

47. How much mucus and other secretions does a typical person produce (and technically eat!) in a single day? Select the best choice that a scientist would choose.

A It's not polite to talk about, so 0 liters.
B 1 liter
C 5 liters
D 50 liters
E 500 liters. Please don't tell anyone.

48. A patient comes to your clinic who is having trouble breathing deepy. You take an X-ray of their thorax (shown on the right). Before you get a chance to look at it, you drop the picture and can't figure out which side is left or right. When you eventually look, you see that the patient has inhaled an object. Where would you expect to find this object?

A. Left bronchus
B. Right bronchus
C. Hyaline cartilage
D. Left pulmonary artery
E. Right pulmonary artery

49. What best describes the relationship between the terms "alveoli" and "alveolar sac"?

A The alveolar sac is the name of the lumen of an alveoli
B An alveoli is composed of multiple alveolar sacs
C An alveolar sac is composed of multiple alveoli
D Alveolar sacs are the alveoli which have macrophages in them
E Alveolar sacs are the alveoli which have RBCs in them

50. Select the TWO types of circulations that are present in the lungs.

A Pulmonary
B Coronary
C Digary
D Systemic

51. Breathing consists of which two phases?

A Inhalation
B Mutation
C Metamorphosis
D Exhalation
E Transcytosis

52. You get into a knife fight at your favorite pub. Although you won, you ended up with a large hole in your left thorax. You look in the hole and can see that your left lung was not damaged in any way. However, you have significant trouble breathing and begrudgingly decide to go to a hospital, despite winning the fight. What best explains why you cannot breathe well?

A You suffered brain damage in the fight and can no longer control some bodily functions.
B Your pleural cavity is at atmospheric pressure and you no longer have any transpulmonary pressure.
C You damaged intercostal muscles and they can no longer contract to expand your thoracic volume.
D Your breathatory muscles are all contracted (they are in tetanus) due to adrenaline from the fight.
E Your lungocyte cells fell out, more will be produced because they are homeostatically regulated.

Questions 53-58 are statements which may be true or false. Determine if they are correct. **53. During tidal breathing, inspiration and exhalation are both active processes that require muscle contraction?** **54. During inspiration, your thoracic volume increases.** **55. During inspiration, your intra-pulmonary pressure increases.** **56. During inspiration, atmospheric pressure measurably increases, globally.** **57. External respiration occurs at the lung.** **58. Internal respiration occurs at a vascularized tissue.**	A. True B. False C. Not enough information

59. For zero (0) points, draw a picture of a heart including all 4 chambers and valves. Or a spider.