Name: _____

Physiology: Cardiovascular System Worksheet: Blood and Blood Cells

Directions: Write in and circle best answer on this sheet.

Blood

1. When spun, the 2 main components of blood are _____ and _____.

2. The plasma of blood is about _____% water. The most abundant protein in the blood is _____ and it has a big role in drawing water from the interstitium back into the blood vessels.

3. In terms of viscosity, blood is _____ viscous than water. Normally, blood is about _____ times the viscosity of water. This has the effect of _____ its resistance to flow.

4. The major proteins in the plasma are made by the organ the _____. The only exception is to this are the _____, which are made by _____.

5. Circle True or False: The buffy coat is the portion of a blood sample that is made up of proteins. **T** or **F**

6. In terms of the pH, venous blood in the systemic circuit is more _____ than arterial blood. This is mainly because venous blood contains more _____ than arterial blood.

7. The LDL's transport lipids in the blood from the _____ to the _____.

8. Make a list at least 10 of the main substances normally found in dissolved in blood plasma:

9. Define hematocrit: _____.

10. The average healthy hematocrit values for females is: _____ and for males is: _____.

11. Circle the statements that are **true** about mature, circulating **erythrocytes**.
a) they have no nucleus **b)** they are packed with mitochondria **c)** they survive for an average of 12 days
d) their average size is 20 to 30 µm **e)** they are very flexible cells **f)** they do not make ATP at all
g) they contain spectrin in their cell membranes **h)** they have enzymes for glycolysis

12. a) A molecule of hemoglobin contains 4 _____ portions and 4 _____ portions.

b) At the center of each _____ is an _____ containing _____ molecule.

13. Aging and damaged erythrocytes are removed from the circulation by _____ cells, most prominently from the _____ when they traverse through the _____ capillaries in that organ.

14. What is polycythemia? _____.

15. What is thalassemia? _____.

Blood Cells

16. Normally, the % of white blood cells in blood is about _____% and the % of red blood cells is _____%.

17. All blood cells (red, white & platelets) start with the exact same _____ stem cell.

18. With regard to the formation of red blood cells, the **myeloid stem cell** generates _____ cells. The _____ are the stem cells for RBCs. As they mature they extrude the nucleus and fill with hemoglobin and become _____. Then these cells become _____.

19. List the most significant features of red blood cells (RBCs) and how it specializes them for their function:

1)

2)

3)

4)

20. List the white blood cells (WBCs) in blood and briefly describe their roles. *(Never Let Monkeys Eat Bananas)*

1)

2)

3)

4)

5)

21. Which of the following statements about blood is **true**?
a) it's about 92% water **b)** it's slightly more acidic than water **c)** it has a higher viscosity than water
d) it has a low colloid osmotic pressure **e)** a and c

22. Which of the following statements about albumin is true?
a) it draws water out of the blood vessels and into the body's tissue spaces (interstitium)
b) it is the most abundant plasma protein **c)** it's made by plasma cells **d)** all of these are true

23. Which of the following plasma proteins is *not* produced by the liver?
a) fibrinogen **b)** alpha globulin **c)** immunoglobulin **d)** beta globulin **e)** albumin

24. The first step in hemostasis is _____.
a) coagulation **b)** activation of the intrinsic pathway **c)** formation of the platelet plug
d) vascular spasm **e)** activation of the common pathway

25. The cells that are considered the precursor to red blood cells (erythrocytes) are called:
a) reticulocytes **b)** hemocytoblasts **c)** monocytes **d)** platelets **e)** megakaryocytes