# Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class \_\_\_\_\_\_\_\_\_

**Blood Study Guide**

1. Blood is considered both a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tissue. The living blood cells, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, are suspended in the fluid part of the blood known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The formed elements of the blood include the \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_, or RBCs, which make up \_\_\_\_\_\_\_% of the blood, and the thin \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is composed of \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is \_\_\_\_\_% of the blood. The remaining \_\_\_\_\_\_% of the blood is made of plasma.

The percentage of the blood made up of RBCs is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 The pH of human blood is usually between \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_, which means it is slightly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Its temperature is usually about \_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is \_\_\_\_\_\_\_\_\_\_\_\_\_ than normal body temperature. In an adult male, the blood usually has a volume of about \_\_\_\_\_\_\_ liters.

2. Name three plasma proteins and tell what they are used for.

3. Which organs make adjustments if the blood’s pH is too high or too low?

 Protein levels?

4. How do RBCs differ from most other body cells?

5. How do the following characteristics make RBCs efficient oxygen transporters:

 few mitochondria

 anaerobic metabolism

 shape

6. T or F. The number of RBCs determine the oxygen levels in the blood. Explain.

7. What is anemia? What 2 things cause it?

8. Name six circumstances that can result in different types of anemia.

9. What happens to the red blood cells of people with sickle-cell anemia (SCA)?

10. What is meant if someone has sickle-cell trait (SCT)? How is this an advantage?

11. What is polycythemia, what can cause it, and is it beneficial or harmful?

12. How are WBCs different than RBCs?

13. Define diapedesis -

 positive chemotaxis -

 ameboid motion –

14. What are leukocytosis and leukopenia and what are they caused by?

15. In leukemia, cancerous bone marrow produces many white blood cells in a short time. Why is this a

problem?

16. Identify the cell type(s) or blood elements that fit the following descriptions. Insert the correct term or

letter response in the spaces provided.

A. Red blood cell D. Basophil G. Lymphocyte

B. Megakaryocyte E. Monocyte H. Formed elements

C. Eosinophil F. Neutrophil I. Plasma

 \_\_\_\_ 1. Most numerous leukocyte

 \_\_\_\_ 2. \_\_\_\_ 3. \_\_\_\_ 4. Granular leukocytes

 \_\_\_\_ 5. Also called an erythrocyte; anucleate

 \_\_\_\_ 6. \_\_\_\_ 7. Actively phagocytic leukocytes

 \_\_\_\_ 8. \_\_\_\_ 9. Agranular leukocytes

 \_\_\_\_ 10. Fragments to form platelets

\_ \_\_\_ 11. (A) through (G) are examples of these

 \_\_\_\_ 12. Increases during allergy attacks

 \_\_\_\_ 13. Releases histamine during inflammatory reactions

 \_\_\_\_ 14. After originating in bone marrow, may be formed in lymphoid tissue

 \_\_\_\_ 15. Contains hemoglobin

 \_\_\_\_ 16. Primarily water, noncellular; the fluid matrix of blood

 \_\_\_\_ 17. Increases in number during prolonged infections

 \_\_\_\_ 18. Least numerous leukocyte

 \_\_\_\_ 19. \_\_\_\_ 20. Also called white blood cells (#19-23) ,

 \_\_\_\_ 21. \_\_\_\_ 22. \_\_\_\_ 23.

17. Platelets are not cells. Explain this statement.

18. What is hematopoiesis and where does it occur in adults?

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

**J**

19. Label the stem cells and blood cells in the

blanks below .

A. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

D. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

E. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

F. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

G. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

H. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

J. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. How long do RBCs live? What happens to them when they “die”? How long does it take for a new

RBC to form?

21.Cancer patients being treated with chemotherapy drugs designed to destroy rapidly dividing cells are

monitored closely for changes in their RBC and WBC counts. Why?

22. Figure 10-1 depicts in incomplete form the erythropoietin mechanism for regulating the rate of

erythropoiesis. Complete the statements that have answer blanks, and then choose colors (other than

yellow) for the color-coding circles and corresponding structures on the diagram. Color all arrows on

the diagram yellow. Finally, indicate the normal life span of erythrocytes.

0 Kidney 0 Red bone marrow 0 RBCs



23. Check all the factors that would serve as stimuli for erythropoiesis.

\_\_\_\_\_ 1. Hemorrhage \_\_\_\_\_ 3. Living at a high altitude

\_\_\_\_\_ 2. Aerobic exercise \_\_\_\_\_ 4. Breathing pure oxygen

24. What hormones control WBC formation? What causes the release of these hormones?

25. What is done to test for leukemia?

26. What is hemostasis? Name the three phases of hemostasis and summarize what occurs in each phase.

27. Define thrombus –

 coronary thrombosis –

 embolus –

 cerebral embolus -

28. What are some factors that can cause undesirable clotting? How can it be prevented?

29. For the following diseases, explain the causes, symptoms and treatment.

 Thrombocytopenia -

 Hemophilia –

Correctly respond to five questions (#32-36) referring to the following situation. Mrs. Carlyle is pregnant for the first time. Her blood type is Rh negative, her husband is Rh positive, and their first child has been determined to be Rh positive. Ordinarily, the first such pregnancy causes no major problems, but

baby Carlyle is born blue and cyanotic.

32.What is this condition, a result of Rh incompatibility, called?

33.Why is the baby cyanotic?

34.Because this is Mrs. Carlyle's first pregnancy, how can you account for the baby's problem?

35.Assume that baby Carlyle was born pink and healthy. What measures should be taken to prevent

the previously described situation from happening in a second pregnancy with an Rh-positive baby?

36.Mrs. Carlyle's sister has had two miscarriages before seeking medical help with her third

pregnancy. Blood typing shows that she, like her sister, is Rh negative; her husband is Rh

positive. What course of treatment will be followed?

37. What blood type is the universal donor? the universal recipient?

38. When a person is given a transfusion of mismatched blood, a transfusion reaction occurs. Describe the

 sequence of events that occur during a transfusion reaction.

39.Ms.Pratt is claiming that Mr. X is the father of her child. Ms.Pratt's blood type is 0 negative. Her

baby boy has type A positive blood. Mr. X's blood is typed and found to be B positive. Could he be

the father of her child?

If not, what blood type would the father be expected to have?

**DEVELOPMENTAL ASPECTS OF BLOOD**

40. Complete the following statements by inserting your responses in the answer blanks.

A fetus has a special type of hemoglobin, hemoglobin \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that has a particularly high affinity for oxygen. After birth, the infant's fetal RBCs are rapidly destroyed and replaced by hemoglobin A-containing RBCs. When the immature infant liver cannot keep pace with the demands to rid the body of hemoglobin breakdown products, the infant's tissues become yellowed, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Genetic factors lead to several congenital diseases concerning the blood. An anemia in which RBCs become sharp and "log- jam" in the blood vessels under conditions of low-oxygen tension in the blood is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ anemia. Bleeder's disease, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, is a result of a deficiency of certain clotting factors. Diet is important to normal blood formation. Women are particularly prone to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ deficiency anemia because of their monthly menses. A decreased efficiency of the gastric mucosa makes elderly individuals particularly susceptible to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ anemia as a result of a lack of intrinsic factor, which is necessary for vitamin \_\_\_\_\_\_\_\_\_\_\_\_\_ absorption. An important problem in aged individuals is their tendency to form undesirable clots, or \_\_\_\_\_\_\_\_\_\_\_\_\_. Both the young and the elderly are at risk for cancer of the blood, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

41. A red marrow biopsy is ordered for two patients-one a young child and the other an adult. The

specimen is taken from the tibia of the child but from the iliac crest of the adult. Explain why

different sites are used to obtain marrow samples in adults and children. (You might want to check

Chapter 5 for this one.)