29 EXERCISE

# REVIEW SHEET

# Blood

Instructors may assign a portion of the Review Sheet questions using Mastering A&P™

Name Teak Armknecht Lab Time/Date _____

## Composition of Blood

1. What is the blood volume of an average-size adult male? 5-6L liters; an average adult female? 4-5L liters

2. What determines whether blood is bright red or a dull brick red? The bright red blood is oxygenated. The dull brick red is deoxygenated

3. Use the key to identify the cell type(s) or blood elements that fit the following descriptive statements. Some terms will be used more than once.

*Key:* a. red blood cell; b. megakaryocyte; c. eosinophil; d. basophil; e. monocyte; f. neutrophil; g. lymphocyte; h. platelets; i. plasma

f 1. most numerous leukocyte

d, c, and f 2. granulocytes (3)

a 3. also called an erythrocyte; anucleate formed element

e, f, d 4. phagocytic leukocytes (3)

e, g 5. agranulocytes

b 6. precursor cell of platelets

h 7. cell fragments

c 8. involved in destroying parasitic worms

d 9. releases histamine; promotes inflammation

g 10. produces antibodies

a 11. transports oxygen

i 12. primarily water, noncellular; the fluid matrix of blood

e 13. exits a blood vessel to develop into a macrophage

c, e, d, g, f 14. the five types of white blood cells

4. Define *formed elements*. Cells and cell fragments in the blood

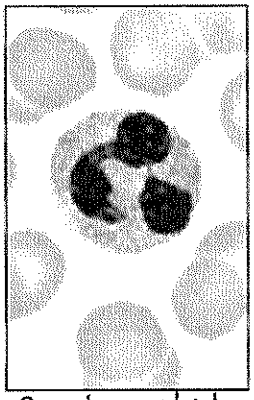
List the formed elements present in the blood. Erythrocytes, Leukocytes, Platelets

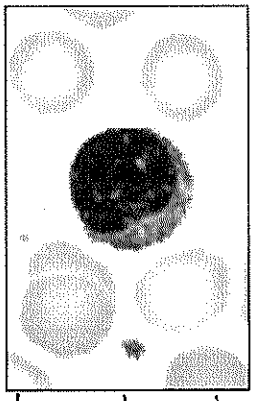
5. Describe the consistency and color of the plasma you observed in the laboratory. Plasma is a clear- yellowish color liquid

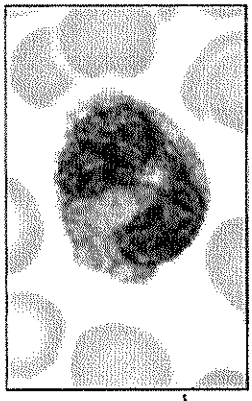
6. What is the average life span of a red blood cell? How does its anucleate condition affect this life span?

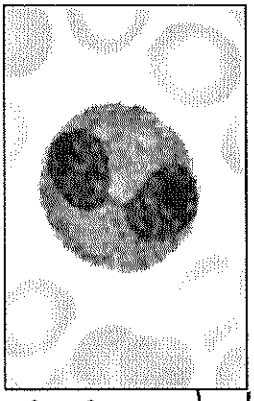
The average life span is 100-120 days. Being anucleate, they are unable to reproduce or repair, so they are destroyed at the end of their life span

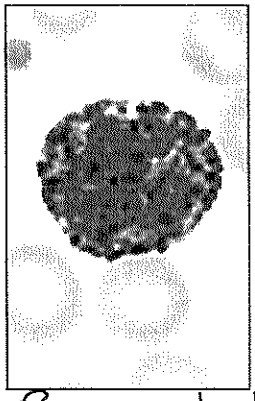
7. Identify the leukocytes shown in the photomicrographs below.


Neutrophil


Lymphocyte


monocyte


eosinophil


Basophil

8. Correctly identify the blood pathologies described in column A by matching them with selections from column B:

| Column A | | Column B |
|---|---|---|
| b | 1. abnormal increase in the number of WBCs | a. anemia |
| d | 2. abnormal increase in the number of RBCs | b. leukocytosis |
| a | 3. condition of too few RBCs or of RBCs with hemoglobin deficiencies | c. leukopenia |
| c | 4. abnormal decrease in the number of WBCs | d. polycythemia |

## Hematologic Tests

9. In the chart below, record information from the blood tests you read about or conducted. Complete the chart by recording values for healthy male adults and indicating the significance of high or low values for each test.

| Test | Student test results | Normal values (healthy male adults) | Significance | |
|---|---|---|---|---|
| | | | High values | Low values |
| Total WBC count | No data | | Leukocytosis | Leukopenia |
| Total RBC count | No data | | polycythemia | anemia |
| Hematocrit | | 47.0 ± 5 | | |
| Hemoglobin determination | | 13-18g | | |
| Bleeding time | No data | | | |
| Coagulation time | | 2-6min | | |

10. Why is a differential WBC count more valuable than a total WBC count when trying to determine the specific source of pathology? A differential WBC count is more valuable because it determines the amounts and percentages of each WBC type. Total WBC count only shows the number of WBC

11. Discuss the effect of each of the following factors on RBC count. Consult an appropriate reference as necessary, and explain your reasoning.

long-term effect of athletic training (for example, running 4 to 5 miles per day over a period of 6 to 9 months): It would increase the number of RBCs, because the body would adapt to carry more oxygen

a permanent move from sea level to a high-altitude area: Increase # of RBCs so body can carry more oxygen

12. Define *hematocrit*. Proportion of blood that consists of RBCs

13. If you had a high hematocrit, would you expect your hemoglobin determination to be high or low? high

Why? if you had high RBCs, you would also have high hemoglobin

14. What is an anticoagulant? prevents the blood from clotting

Name two anticoagulants used in conducting the hematologic tests. Sodium citrate

and Heparin

What is the body's natural anticoagulant? Heparin

15. If your blood agglutinates with anti-A but not anti-B sera, your ABO blood type would be A.

To what ABO blood groups could you donate blood? A

From which ABO donor types could you receive blood? A, O

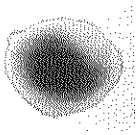
Which ABO blood type is most common? O Least common? AB

16. What blood type is theoretically considered the universal donor? O- Why?

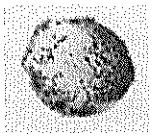
O has no antigens

17. Assume the blood of two patients has been typed for ABO blood type.

Typing results
Mr. Adams:

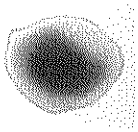


Blood drop and anti-A serum

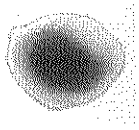


Blood drop and anti-B serum

Typing results
Mr. Calhoon:



Blood drop and anti-A serum



Blood drop and anti-B serum

On the basis of these results, Mr. Adams has type B blood, and Mr. Calhoon has type O blood.

18. Explain why an Rh-negative person does not have a transfusion reaction on the first exposure to Rh-positive blood but does have a reaction on the second exposure. The person has antigens after the 1st exposure

19. Record your observations of the five demonstration slides viewed.

a. Macrocytic hypochromic anemia: RBC's are translucent in center

b. Microcytic hypochromic anemia: have a bullseye appearance

c. Sickle cell anemia: sickle shaped

d. Lymphocytic leukemia (chronic): increased WBC

e. Eosinophilia: increased eosinophils

Which of the slides above (a through e) corresponds with the following conditions?

b 1. iron-deficient diet

d 2. a type of bone marrow cancer

c 3. genetic defect that causes hemoglobin to become sharp/spiky

a 4. lack of vitamin $B_{12}$

e 5. a tapeworm infestation in the body

b 6. a bleeding ulcer

20. Provide the normal, or at least "desirable," range for plasma cholesterol concentration.

130 - 200 mg/100 ml

21. Plasmapheresis is a procedure in which blood is removed, its plasma is separated from the formed elements, and the formed elements are returned to the patient or donor. Kidney transplants usually require that the donor and recipient have the same blood type. If plasmapheresis is administered to the patient before and after the transplant surgery, rejection of the kidney is unlikely to occur. Explain why.

It removes the antibodies from the donors cells, so the patient's body accepts it

22. Bleeding disorders are usually a result of thrombocytopenia, a deficiency of platelets. Considering the mechanism of hemostasis, explain why thrombocytopenia could lead to abnormal bleeding. If you have low platelets, it will be hard for your blood to clot, leading to abnormal bleeding