**Chapter 1: Introduction**

*Multiple-Choice Questions*

*Level I*

1. Which two populations account for the greatest difference in reference intervals?
   1. Adults and 12-year-olds
   2. Newborns and 12-year-olds
   3. Newborns and adults
   4. Whites and blacks

Correct answer: C

(Objective 1)

1. What component of plasma assists in the transport of bilirubin?
   1. Enzymes
   2. Hydrogen
   3. Calcium
   4. Albumin

Correct answer: D

(Objective 3)

1. When bilirubin is increased above the reference range, what disease process should be suspected if liver disease is ruled out?
   1. Increased osmotic pressure
   2. Hormone imbalance
   3. Decreased albumin
   4. Increased metabolism of hemoglobin

Correct answer: D

(Objective 3, 4)

1. Which of the following can explain a decrease in the number of circulating erythrocytes?
   1. Blood loss
   2. Infection
   3. Dehydration
   4. Neutropenia

Correct answer: A

(Objective 4)

1. Platelets and coagulation proteins are circulating components responsible for what process?
   1. Hemolysis
   2. Hemostasis
   3. Normal cell production
   4. Immune defense

Correct answer: B

(Objective 2)

6. The predominant blood leukocyte found in children is the:

1. Monocyte
2. Lymphocyte
3. Neutrophil
4. Eosinophil

Correct answer: B

(Objective 1)

7. The cellular component of blood that is involved in hemostasis is:

a. Leukocyte

b. Erythrocyte

c. Thrombocyte

d. Hemoglobin

Correct answer: C

(Objective 2)

8. The protein found in erythrocytes that is responsible for oxygen transport is:

a. Albumin

b. Gamma globulin

c. Oxygen protein

d. Hemoglobin

Correct answer: D

(Objective 2)

9. Which of the following is *not* a cellular component of blood?

a. Leukocyte

b. Platelets

c. Erythrocyte

d. Albumin

Correct answer: D

(Objective 3)

10. The liquid portion of blood is called:

a. Bilirubin

b. Plasma

c. Whole blood

d. Albumin

Correct answer: B

(Objective 3)

11. What percentage of the total blood volume is composed of formed elements?

a. 55

b. 45

c. 100

d. 10

Correct answer: B

(Objective 3)

12. An abnormal test result is defined as:

a. The opposite of a normal test result

b. A value that is outside the reference interval for a particular analyte

c. A value that is below the reference interval for multiple analytes

d. A value that is above the reference interval for a single analyte

Correct answer: B

(Objective 4)

13. Which of the following is *not* a role of the clinical laboratory professional?

a. Correlate lab results with appropriate disease states

b. Correlate lab results with disease pathophysiology

c. Correlate lab results with treatment

d. Order reflex tests

Correct answer: D

(Objective 5)

14. Which of the following is a hematology screening test?

a. Complete blood count (CBC)

b. Activated partial thromboplastin time (APTT)

c. Osmotic pressure

d. Chloride concentration

Correct answer: A

(Objective 7)

15. Which of the following represents an event in the pre-examination phase of laboratory testing?

a. Reporting of results

b. Interpretation of laboratory data

c. Performing a test procedure

d. Labeling a blood collection tube

Correct answer: D

(Objective 8)

*Level II*

1. Which of the following is an expected finding in a newborn?

a. WBC count = 2 × 109/L

b. PLT count = 100 × 109/L

c. Hemoglobin = 17.0 g/dL

d. RBC count = 3.50 × 109/L

Correct answer: C

(Objective 1)

2. Which of the following blood cell components would be most influenced in a patient with an infection of the tonsils (tonsillitis)?

a. Leukocyte

b. Erythrocyte

c. Thrombocyte

d. Hemoglobin

Correct answer: A

(Objective 2)

3. When decreased in concentration, which of the following formed elements could result in hypoxia?

a. Leukocytes

b. Erythrocytes

c. Platelets

d. None of the above

Correct answer: B

(Objective 2)

4. Which component of blood passes through blood vessel walls into surrounding tissues to defend the body against invading foreign antigens?

a. Red blood cells

b. Platelets

c. Leukocytes

d. Gamma globulin

Correct answer: C

(Objective 2)

5. Which of the following blood constituents is associated with increased red blood cell destruction?

a. Bilirubin

b. Albumin

c. Blood urea nitrogen

d. Immunoglobulin

Correct answer: A

(Objective 4)

6. All of the following must be considered when establishing a reference interval for a group of individuals *except:*

a. The geographic area

b. Age of the population

c. Occupations of the population

d. Sex of the population

Correct answer: C

(Objective 4)

7. Which of the following tests could be reflexed as the result of an abnormal prothrombin time?

a. Molecular analysis of clotting factors

b. Complete blood count

c. Measurement of albumin

d. Hemoglobin analysis

Correct answer: A

(Objective 5)

8. Which of the following could be reflexed as the result of an abnormal RBC count?

a. Prothrombin time

b. Blood urea nitrogen

c. Reticulocyte count

d. WBC count

Correct answer: C

(Objective 5)

9. Patients who are unable to dissolve a fibrin blood clot are likely to present with which of the following pathologies?

a. Anemia

b. Bleeding

c. Thrombosis

c. Leukemia

Correct answer: C

(Objective 6)

10. An unlabeled blood collection tube is delivered to the hematology laboratory. The laboratory professional requests a redraw because an error in which phase of laboratory testing has occurred?

a. Pre-examination

b. Examination

c. Post-examination

d. Analytical

Correct answer: A

(Objective 8)

*Short-Answer Questions*

1. Explain how a reference interval is determined.

*Answer:* A reference interval for a given geographical region is determined by calculating the mean for a group of “normal healthy” individuals. Conditions that must be considered include physiologic differences in a given population as well as the geographic area. Once the mean has been determined, a calculation to determine the standard deviation must be performed. The range is calculated by taking the mean and 2 standard deviations above and below the mean value.

(Objective 1, Level II)

1. Name three blood analytes that show significantly different results in adults, children, and infants.

*Answer:* Hemoglobin is higher in infants and children than in adults. WBC counts are higher in infants than in children and adults. Differential results are different in children (inverted ratio of lymphs: neutrophils) than in infants and adults.

(Objective 1, Level I)

1. Explain how the hemostatic pathway is activated in times of need.

*Answer:* Traumatic events to body tissue stimulate the activation of repair mechanisms. As a result of both external and internal stimuli, the hemostatic pathway becomes activated in stages called *primary* and *secondary hemostasis* and f*ibrinolysis.*

(Objective 4, Level II)

1. Give two reasons for transfusing leukoreduced, irradiated, packed red blood cells.

*Answer:* Reasons for transfusing leukoreduced packed red blood cells are to decrease the risk of febrile nonhemolytic transfusion reactions, to decrease the risk of HLA sensitization, and to decrease the risk of CMV transmission. Irradiation is used to reduce the risk of graft-versus-host disease.

(Objective 3, Level II)

5. Explain how screening tests and reflexing testing are related.

*Answer:* In an attempt to reach a cost-effective and efficient diagnosis, a physician’s investigation into a hematologic or hemostatic problem begins with screening tests. The results of these tests provide the clues to the diagnosis. Depending on the results of screening tests, more specific tests (reflex tests) can be ordered. The laboratory professional can aid the physician in choosing the appropriate reflex tests that will narrow the scope for the patient diagnosis.

(Objectives 5 and 7, Level II)