Section 8.2: Review Answers

Student Textbook page 291

1. Summary of cellular components of blood.

Point of Comparison	Red blood cells	Leucocytes	Lymphocytes	Platelets
Origin	red bone marrow	red bone marrow	thymus, red bone marrow	red bone marrow, lungs
Cells present per mm^3 of blood	5 500 000 (male) 4 500 000 (female)	6000	2000	250 000
Relative size	small	largest	large	smallest
Function	to carry oxygen and carbon dioxide to and from cells	to engulf foreign particles and pathogens	to play a role in the formation of antibodies	to play a role in the clotting of blood
Life span	120 days	a few hours to a few days	unknown	2 to 8 days

Point of Comparison	Red blood cells	Leucocytes	Lymphocytes	Platelets
Appearance	biconcave disc; no nucleus	granular; large nucleus visible	not granular; large nucleus	small cell fragments

2. Plasma contains water, blood proteins (fibrinogen, serum albumin, serum globulin), organic substances (urea, glucose, amino acids, lipids), inorganic ions (calcium, chloride, magnesium, potassium, sodium, bicarbonates, carbonates, phosphates), some dissolved oxygen and carbonic acid.

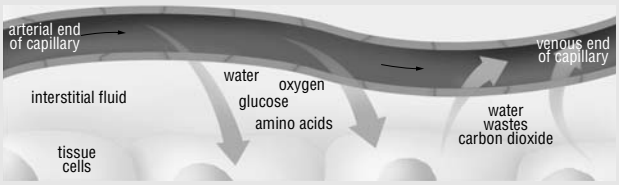
3. (a) The circulatory system and digestive system: nutrients such as glucose and amino acids diffuse directly into capillaries in the villi of the small intestine; blood transports these nutrients to the liver and other organs/cells of body. The blood also absorbs water, salts (minerals) and vitamins B and K from the large intestine.

(b) The circulatory system and endocrine system: hormones secreted by endocrine glands are taken up in the blood and transported throughout the body, thereby communicating with their specific target organs.

(c) The circulatory system and respiratory system: red blood cells pick up and transport oxygen from the lungs to the cells. Carbon dioxide dissolves in blood plasma and enters the red blood cells in the capillary networks throughout the body and is then transported to the lungs.

(d) Circulatory system and excretory system: blood transports nitrogenous wastes (urea and uric acid) from the cells to the kidneys where these toxic substances are removed from the blood. The kidneys also control the osmotic pressure and the pH of the blood.

4. The following diagram shows the materials exchanged between blood in the capillaries and the surrounding cells. The arrows show the direction in which the force of diffusion acts in this exchange.



5. (a) One disorder that causes a low hematocrit is leukemia. This disease is characterized by anemia, fatigue, increased susceptibility to infectious diseases and increased blood clotting time due to a low platelet count.

(b) The following flow chart summarizes some of the steps in the blood clotting process: