Note

VESSELS & LYMPHATICS

- Veins return blood toward the heart, while arteries carry blood away from it.
- Lymphatic vessels return excess tissue fluid to the blood. Oxygen content does not define artery vs. vein.

Easy rule: Direction, not oxygen, names the vessel.

Question 1

Which blood vessels return blood to the heart?

(a) Veins
(b) Capillaries
(c) Arteries
(d) Arterioles

Correct answer (a) Veins

Question 2

Which structures return excess tissue fluid to the blood vessels?

(a) Lymphatic vessels
(b) Pulmonary arteries
(c) Coronary veins
(d) Capillaries

Correct answer (a) Lymphatic vessels

Note

VESSELS & LYMPHATICS

- Veins return blood toward the heart, while arteries carry blood away from it.
- Lymphatic vessels return excess tissue fluid to the blood. Oxygen content does not define artery vs. vein.

Easy rule: Direction, not oxygen, names the vessel.

Question 3

Does the oxygen content of blood determine whether a vessel is an artery or a vein?

(a) Yes

(b) No

Correct answer (b) No

Note

VESSELS & LYMPHATICS

- Blood pressure is generally high in arteries and low in veins.
- Capillary blood flow is slow, which favors exchange with tissues.

Easy rule: High in arteries; slow in capillaries.

Question 4

Blood pressure in the veins is generally:

(a) High

(b) Low

Correct answer (b) Low

Question 5

Blood pressure in the arteries is generally:

(a) High

(b) Low

Correct answer (a) High

Note

VESSELS & LYMPHATICS

- Blood pressure is generally high in arteries and low in veins.
- Capillary blood flow is slow, which favors exchange with tissues.

Easy rule: High in arteries; slow in capillaries.

Question 6

Blood flow in the capillaries is generally:

(a) Fast

(b) Slow

Correct answer (b) Slow

Note

VESSELS & LYMPHATICS

- Lymph nodes filter lymph before it returns to the veins.
- Lymphatic vessels have valves, and skeletal muscle contraction helps move both venous blood and lymph.

Easy rule: Valves + muscle pump support low-pressure flow.

Question 7

Which structures filter potentially harmful material from lymph before it returns to the veins?

(a) Lymph nodes
(b) Lymph vessels
(c) Arteries
(d) Ventricles

Correct answer (a) Lymph nodes

Question 8

Compared with the combined diameters of the capillaries, the diameter of a single artery is:

(a) Larger
(b) Smaller

Correct answer (b) Smaller

Note

VESSELS & LYMPHATICS

- Lymph nodes filter lymph before it returns to the veins.
- Lymphatic vessels have valves, and skeletal muscle contraction helps move both venous blood and lymph.

Easy rule: Valves + muscle pump support low-pressure flow.

Question 9

Do lymphatic vessels have valves?

(a) Yes

(b) No

Correct answer (a) Yes

Question 10

Blood moves through veins and lymph moves through lymphatic vessels when nearby _____ contract and squeeze the vessels.

(a) Skeletal muscles

(b) Cardiac muscles

(c) Smooth muscles of the stomach

(d) Red blood cells

Correct answer (a) Skeletal muscles

Note

HEART FLOW & VALVES

- Blood leaves the heart from ventricles and enters it through atria.
- The aorta carries oxygen-rich blood away from the heart; venae cavae bring oxygen-poor blood back.
- Pulmonary arteries go to the lungs; pulmonary veins return to the heart.

Easy rule: Follow the direction of flow through each vessel.

Question 11

Blood leaves the heart from _____ and enters the heart at _____.

(a) Atria; ventricles

(b) Ventricles; atria

(c) Capillaries; arteries

(d) Veins; arteries

Correct answer (b) Ventricles; atria

Question 12

Which statement correctly compares the aorta and the venae cavae?

(a) The aorta carries oxygen-rich blood away from the heart; the venae cavae carry oxygen-poor blood toward the heart

(b) The aorta carries oxygen-poor blood toward the heart; the venae cavae carry oxygen-rich blood away from the heart

(c) Both carry oxygen-rich blood away from the heart

(d) Both carry oxygen-poor blood toward the lungs

Correct answer (a) The aorta carries oxygen-rich blood away from the heart; the venae cavae carry oxygenpo blood toward the heart

Note

HEART FLOW & VALVES

- Blood leaves the heart from ventricles and enters it through atria.
- The aorta carries oxygen-rich blood away from the heart; venae cavae bring oxygen-poor blood back.
- Pulmonary arteries go to the lungs; pulmonary veins return to the heart.

Easy rule: Follow the direction of flow through each vessel.

Question 13

What is the main site of exchange between blood and tissues?

(a) Arteries

(b) Veins

(c) Capillaries

(d) Atria

Correct answer (c) Capillaries

Question 14

Which statement correctly compares pulmonary arteries and pulmonary veins?

(a) Pulmonary arteries carry oxygen-poor blood away from the heart; pulmonary veins carry oxygen-rich blood toward the heart

(b) Pulmonary arteries carry oxygen-rich blood toward the heart; pulmonary veins carry oxygen-poor blood away from the heart

(c) Both carry oxygen-rich blood away from the heart

(d) Both carry oxygen-poor blood toward the heart

Correct answer (a) Pulmonary arteries carry oxygen-poor blood away from the heart; pulmonary veins carry oxygen-rich blood toward the heart

Note

HEART FLOW & VALVES

- Blood leaves the heart from ventricles and enters it through atria.
- The aorta carries oxygen-rich blood away from the heart; venae cavae bring oxygen-poor blood back.
- Pulmonary arteries go to the lungs; pulmonary veins return to the heart.

Easy rule: Follow the direction of flow through each vessel.

Question 15

Blood entering the right atrium after circulating through the body is:

(a) Oxygen-rich

(b) Oxygen-poor

Correct answer (b) Oxygen-poor

Note

HEART FLOW & VALVES

- Semilunar valves separate ventricles from the arteries.
- The first heart sound begins with closure of the atrioventricular valves.
- The pulmonary circuit carries blood between the heart and lungs; oxygen-rich blood returns to the left atrium.

Easy rule: AV valves close first; pulmonary veins return to left atrium.

Question 16

Which valves separate the ventricles from the arteries?

(a) Semilunar valves
(b) Atrioventricular valves
(c) Venous valves
(d) Lymphatic valves

Correct answer (a) Semilunar valves

Question 17

The first heart sound is mainly produced by closure of the _____ valves at the _____ of ventricular contraction.

(a) Semilunar; end
(b) Atrioventricular; beginning
(c) Semilunar; beginning
(d) Atrioventricular; end

Correct answer (b) Atrioventricular; beginning

Note

HEART FLOW & VALVES

- Semilunar valves separate ventricles from the arteries.
- The first heart sound begins with closure of the atrioventricular valves.
- The pulmonary circuit carries blood between the heart and lungs; oxygen-rich blood returns to the left atrium.

Easy rule: AV valves close first; pulmonary veins return to left atrium.

Question 18

From the right ventricle, _____ blood is pumped into the _____ and then to the lungs.

(a) Oxygen-rich; pulmonary veins
(b) Oxygen-poor; pulmonary arteries
(c) Oxygen-rich; aorta
(d) Oxygen-poor; venae cavae

Correct answer (b) Oxygen-poor; pulmonary arteries

Question 19

Which circuit sends blood to the lungs?

(a) Pulmonary circuit
(b) Systemic circuit
(c) Coronary circuit only
(d) Lymphatic circuit

Correct answer (a) Pulmonary circuit

Note

HEART FLOW & VALVES

- Semilunar valves separate ventricles from the arteries.
- The first heart sound begins with closure of the atrioventricular valves.
- The pulmonary circuit carries blood between the heart and lungs; oxygen-rich blood returns to the left atrium.

Easy rule: AV valves close first; pulmonary veins return to left atrium.

Question 20

Oxygen-rich blood from the lungs enters the heart first at the:

(a) Right atrium

(b) Right ventricle

(c) Left atrium

(d) Left ventricle

Correct answer (c) Left atrium

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 21

From the right atrium, blood passes immediately to the:

(a) Left ventricle
(b) Right ventricle
(c) Left atrium
(d) Pulmonary artery
(e) Posterior vena cava

Correct answer (b) Right ventricle

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 22

Which statement about blood is FALSE?

(a) Mature red blood cells are not nucleated

(b) Blood platelets are involved in clotting

(c) The adult spleen is a site of red blood cell development

(d) White blood cells can phagocytose foreign matter

(e) New red blood cells continually develop in bone marrow

Correct answer (c) The adult spleen is a site of red blood cell development

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 23

Which of the following is a normal pathway of blood flow?

(a) Right ventricle to aorta

(b) Pulmonary veins to left atrium

(c) Inferior vena cava to left atrium

(d) Pulmonary veins to left ventricle

(e) Left ventricle to pulmonary artery

Correct answer (b) Pulmonary veins to left atrium

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 24

Which is the most likely response when blood calcium falls too low?

(a) The thyroid releases calcitonin

(b) The parathyroid glands release PTH

(c) The pancreas releases glucagon

(d) The pituitary releases growth hormone

(e) The thyroid releases thyroid hormone

Correct answer (b) The parathyroid glands release PTH

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 25

Which statement about the heart is correct?

(a) The right ventricle pumps blood to the aorta

(b) The left ventricle pumps blood to the entire body

(c) The right atrium receives oxygenated blood from the lungs

(d) The right ventricle pumps blood to the right atrium

(e) The right ventricle has the thickest wall

Correct answer (b) The left ventricle pumps blood to the entire body

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 26

All of the following are correct about gas exchange in humans EXCEPT:

(a) Hemoglobin carries oxygen and carbon dioxide in fairly equal amounts

(b) Breathing rate is regulated by the medulla of the brain

(c) The nose filters, warms, and moistens air

(d) Gas exchange occurs in alveoli

(e) Increased carbon dioxide lowers blood pH

Correct answer (a) Hemoglobin carries oxygen and carbon dioxide in fairly equal amounts

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 27

All of the following are correct about human red blood cells EXCEPT:

(a) They live about 120 days

(b) They are called leukocytes

(c) They lack a nucleus

(d) They are formed in bone marrow

(e) They carry oxyhemoglobin

Correct answer (b) They are called leukocytes

Note

HEART, BLOOD & REGULATION

- Normal flow from the right atrium continues to the right ventricle, then through the pulmonary circulation.
- Low blood calcium stimulates the parathyroid glands to release PTH.
- The left ventricle drives systemic circulation; the SA node is the heart's pacemaker.
- Mature red blood cells lack nuclei, are produced in bone marrow, and carry oxygen through hemoglobin.
- Breathing rate is regulated by the medulla, and increased carbon dioxide lowers blood pH.

Easy rule: Right heart -> lungs; left ventricle -> body.

Question 28

All of the following are correct about human circulation EXCEPT:

(a) Arteries have thick muscular walls

(b) The SA node is the heart's pacemaker

(c) Leukocytes fight disease

(d) Hemoglobin carries oxygen

(e) The aorta is the only artery that carries deoxygenated blood

Correct answer (e) The aorta is the only artery that carries deoxygenated blood

Note

CLOTTING & CIRCULATION

- Fibrinogen, thromboplastin, calcium ions, and platelets are associated with clotting.
- Normal blood flow follows one-way pathways through chambers, valves, and vessels.

Easy rule: Clotting needs factors; circulation needs correct direction.

Question 29

All of the following are related to blood clotting EXCEPT:

(a) Fibrinogen
(b) Erythrocytes
(c) Thromboplastin
(d) Calcium ions
(e) Thrombocytes

Correct answer (b) Erythrocytes

Question 30

All of the following show a normal direction of blood flow EXCEPT:

(a) Vena cava -> right ventricle
(b) Right atrium -> tricuspid valve
(c) Aortic semilunar valve -> aorta
(d) Lungs -> pulmonary vein
(e) Pulmonary vein -> left atrium

Correct answer (a) Vena cava -> right ventricle

Note

CLOTTING & CIRCULATION

- Fibrinogen, thromboplastin, calcium ions, and platelets are associated with clotting.
- Normal blood flow follows one-way pathways through chambers, valves, and vessels.

Easy rule: Clotting needs factors; circulation needs correct direction.

Question 31

Which sequence correctly follows blood flow in the human body?

(a) Right ventricle -> aorta -> body -> left atrium -> left ventricle -> pulmonary artery

(b) Right ventricle -> pulmonary artery -> lungs -> pulmonary vein -> left atrium

(c) Left atrium -> left ventricle -> pulmonary artery -> pulmonary vein -> right atrium

(d) Left atrium -> left ventricle -> pulmonary artery -> lungs -> pulmonary vein -> right atrium

(e) Left ventricle -> left atrium -> aorta -> lungs -> pulmonary vein

Correct answer (b) Right ventricle -> pulmonary artery -> lungs -> pulmonary vein -> left atrium

Note

CLOTTING & CIRCULATION

- Capillary flow is slow for diffusion, while arteries have thicker muscular walls than veins.
- Most carbon dioxide is carried as bicarbonate in plasma. Leukocytes defend against germs.

Easy rule: Capillaries exchange; arteries withstand pressure.

Question 32

All of the following are correct about human circulation EXCEPT:

(a) Blood moves slowly through capillaries to allow diffusion

(b) Normal blood pressure is always higher in males than in females

(c) Average resting pulse is about 70 beats per minute

(d) Heart rate changes with physical activity

(e) Arteries have thicker walls than veins

Correct answer (b) Normal blood pressure is always higher in males than in females

Question 33

Most carbon dioxide is carried to the lungs as:

(a) Carbon dioxide dissolved only in erythrocytes

(b) Carbon dioxide attached mainly to platelets

(c) Bicarbonate ions in plasma

(d) Carbon dioxide carried by leukocytes

(e) Fibrin-bound carbon dioxide

Correct answer (c) Bicarbonate ions in plasma

Note

CLOTTING & CIRCULATION

- Capillary flow is slow for diffusion, while arteries have thicker muscular walls than veins.
- Most carbon dioxide is carried as bicarbonate in plasma. Leukocytes defend against germs.

Easy rule: Capillaries exchange; arteries withstand pressure.

Question 34

All of the following are true about blood EXCEPT:

(a) White blood cells are formed in bone marrow

(b) Platelets are cell fragments

(c) Arteries contain valves along their length to help pump blood

(d) Plasma is the liquid portion of blood

(e) Red blood cells live about 120 days

Correct answer (c) Arteries contain valves along their length to help pump blood

Question 35

Which statement is true about the human circulatory system?

(a) Blood pH normally varies widely throughout the day

(b) Erythrocytes clot blood

(c) Leukocytes fight germs

(d) Blood type O is dominant

(e) Humans have an open circulatory system

Correct answer (c) Leukocytes fight germs

Note

CLOTTING & CIRCULATION

- Capillary flow is slow for diffusion, while arteries have thicker muscular walls than veins.
- Most carbon dioxide is carried as bicarbonate in plasma. Leukocytes defend against germs.

Easy rule: Capillaries exchange; arteries withstand pressure.

Question 36

The walls of arteries contain mainly:

(a) Striated muscle under voluntary control

(b) Striated muscle under involuntary control

(c) Smooth muscle controlled by the somatic nervous system

(d) Smooth muscle controlled by the autonomic nervous system

(e) Only connective tissue

Correct answer (d) Smooth muscle controlled by the autonomic nervous system

Note

CARDIAC CYCLE & CAPILLARY EXCHANGE

- During ventricular systole, AV valves close and semilunar valves open.
- The SA node is the normal pacemaker. The Bohr effect is linked to changes in blood pH.
- Blood flow is slowest in capillaries to maximize diffusion.

Easy rule: Systole ejects blood; capillaries maximize exchange.

Question 37

During ventricular systole, which combination is correct?

(a) AV valves open; semilunar valves closed
(b) AV valves closed; semilunar valves open
(c) Both valve sets open
(d) Both valve sets closed
(e) Valve position does not change

Correct answer (b) AV valves closed; semilunar valves open

Question 38

All of the following are true about blood EXCEPT:

(a) Red blood cells live about 120 days
(b) White blood cells are formed in bone marrow
(c) Platelets are cell fragments
(d) Platelets are derived from neutrophils
(e) Plasma is the liquid portion of blood

Correct answer (d) Platelets are derived from neutrophils

Note

CARDIAC CYCLE & CAPILLARY EXCHANGE

- During ventricular systole, AV valves close and semilunar valves open.
- The SA node is the normal pacemaker. The Bohr effect is linked to changes in blood pH.
- Blood flow is slowest in capillaries to maximize diffusion.

Easy rule: Systole ejects blood; capillaries maximize exchange.

Question 39

Which statement shows the normal direction of blood flow?

(a) Lungs -> pulmonary artery
(b) Right ventricle -> tricuspid valve
(c) Aorta -> aortic semilunar valve
(d) Vena cava -> right atrium
(e) Pulmonary vein -> pulmonary artery

Correct answer (d) Vena cava -> right atrium

Question 40

The pacemaker of the heart is the:

(a) Sinoatrial node
(b) Atrioventricular node
(c) Diastolic node
(d) Semilunar node
(e) None of the above

Correct answer (a) Sinoatrial node

Note

CARDIAC CYCLE & CAPILLARY EXCHANGE

- During ventricular systole, AV valves close and semilunar valves open.
- The SA node is the normal pacemaker. The Bohr effect is linked to changes in blood pH.
- Blood flow is slowest in capillaries to maximize diffusion.

Easy rule: Systole ejects blood; capillaries maximize exchange.

Question 41

The Bohr effect on the oxyhemoglobin dissociation curve is produced directly by changes in:

(a) Temperature only
(b) pH
(c) Platelet count
(d) Oxygen concentration only
(e) Hematocrit

Correct answer (b) pH

Question 42

Which statement is TRUE of the human circulatory system?

(a) The right ventricle has the thickest wall
(b) Veins have thicker walls than arteries
(c) Blood flow is slowest in capillaries to maximize diffusion
(d) The left and right ventricles contract alternately
(e) Humans have an open circulatory system

Correct answer (c) Blood flow is slowest in capillaries to maximize diffusion