

Chapter 10 :

1. Resistance

- (a) is a measure of the hindrance to blood flow through a vessel caused by friction between the moving fluid and stationary vascular walls.
- (b) is doubled when the radius of the vessel is reduced by one-half.
- (c) increases sixteen-fold when the radius of the vessel is reduced by one-half.
- (d) both (a) and (b) above.
- (e) both (a) and (c) above.

ANSWER: e

2. Resistance increases when

- (a) radius decreases.
- (b) length decreases.
- (c) viscosity decreases.
- (d) hematocrit decreases.
- (e) none of these answers.

ANSWER: a

3. Vasoconstriction

- (a) refers to a decrease in the radius of a vessel.
- (b) of an arteriole decreases blood flow through that vessel.
- (c) of a vein increases blood flow through that vessel.
- (d) both (a) and (b) above.
- (e) all of these answers.

ANSWER: e

4. Which of the following is the correct relationship between pressure, flow, and resistance?

(a) $\text{flow} = \frac{\text{pressure gradient}}{\text{radius}^4}$

(b) $\text{flow} \times \text{pressure gradient} = \text{resistance}$

(c) $\text{flow} = \frac{\text{pressure gradient}}{\text{resistance}}$

(d) $\text{pressure gradient} = \frac{\text{flow}}{\text{resistance}}$

(e) $\text{resistance} = \frac{\text{flow}}{\text{radius}^4}$

ANSWER: c

5. Blood flow is affected by

- (a) pressure differences.
- (b) the viscosity of the blood.
- (c) the amount of friction in the blood vessels.

- (d) the length and diameter of the blood vessels.
- (e) all of these answers.

ANSWER: e

6. The major determinant influencing resistance to blood flow is the
- (a) viscosity of the blood.
 - (b) radius of the vessel through which the blood is flowing.
 - (c) pressure gradient in the vessel.
 - (d) hematocrit of the blood.
 - (e) amount of plasma protein.

ANSWER: b

7. In an arteriole, if the blood vessel radius is 2 units and then vasoconstricted to 1 units, the resistance:
- (a) the resistance decreases 16 times.
 - (b) the resistance increases 16 times.
 - (c) flow will be decreased.
 - (d) both (a) and (b) above.
 - (e) both (b) and (c) above.

ANSWER: e

8. Which is not true of blood pressure:
- (a) its maximal during ventricular systole.
 - (b) it decreases the farther away from the heart.
 - (c) it increases with increasing resistance.
 - (d) it decreases with increasing vessel diameter.
 - (e) it can be increased by direct parasympathetic activity.

ANSWER: e

9. Which of the following factors would produce the greatest change in blood flow?
- (a) doubling the radius of the vessel.
 - (b) doubling the difference in the pressure gradient within the vessel.
 - (c) doubling the viscosity of the blood.
 - (d) doubling the length of the vessel.
 - (e) halving the viscosity of the blood.

ANSWER: a

10. The major function of the arterioles is to
- (a) regulate flow of blood through capillary beds.
 - (b) distribute the cardiac output to tissues.
 - (c) serve as a pressure reservoir.
 - (d) convert the intermittent flow from the heart to a steady outflow.
 - (e) both (a) and (b) above.

ANSWER: e

11. Because the arteries have large radii, they serve as excellent rapid-transit passageways for blood. Their second function, related to their elasticity, is to act as a _____ for maintaining blood flow during diastole.
- (a) cardiac reserve
 - (b) venous reserve

- (c) arterial capacitance
- (d) lymphatic reserve
- (e) pressure reservoir

ANSWER: e

12. What force continues to drive blood through the vasculature during ventricular diastole?
- (a) ventricular contraction forces blood into the vasculature during ventricular diastole.
 - (b) the elastic recoil of the stretched arterial walls provides the force to continue blood flow in the remaining vascular system during ventricular diastole.
 - (c) sympathetic stimulation produces arterial vasoconstriction, which drives the blood forward into the arterioles during ventricular diastole.
 - (d) skeletal muscle contraction squeezes the blood forward from the arteries during ventricular diastole.
 - (e) respiratory movements produce pressure changes in the chest, which establishes a pressure gradient that drives blood forward from the arteries into the microcirculation.

ANSWER: b

13. The following local chemical changes occur during a period of increased cell activity except
- (a) increased CO₂.
 - (b) increased acid.
 - (c) increased O₂.
 - (d) increased K⁺.
 - (e) increased osmolarity.

ANSWER: c

14. The major resistance vessels of the body are the
- (a) arteries.
 - (b) arterioles.
 - (c) capillaries.
 - (d) lymphatics.
 - (e) veins.

ANSWER: b

15. The largest total cross-sectional area is found in the
- (a) aorta.
 - (b) arterioles.
 - (c) capillaries.
 - (d) venules.
 - (e) veins.

ANSWER: c

16. Through which vessel is the velocity of blood flow the slowest?
- (a) aorta
 - (b) arterioles
 - (c) capillaries
 - (d) venules
 - (e) veins

ANSWER: c

17. As the total cross-sectional area of the vascular tree _____, the velocity of blood flow _____.
- (a) increases, decreases
 - (b) increases, increases
 - (c) decreases, decreases
 - (d) increases, remains constant
 - (e) decreases, remains constant

ANSWER: a