

Multiple choice. Mark the one best answer of your choice (4 pts each).

1. The chordae tendineae are associated with:
 - A. semilunar valves.
 - B. atrioventricular valves.
 - C. the coronary circulation.
 - D. auricles.

2. Glucocorticoids are secreted by:
 - A. the anterior pituitary.
 - B. the thyroid gland.
 - C. the adrenal cortex.
 - D. the gonads (ovaries and testes).

3. Cardiac output is defined as:
 - A. the amount of heart contractions per minute.
 - B. the amount of blood pumped by each ventricle per heart beat.
 - C. the amount of blood that fills the ventricle during its diastole.
 - D. the amount of blood pumped by each ventricle per minute.

4. Parathyroid hormone (PTH) is secreted when parathyroid cells are _____ stimulated.
 - A. hormonally
 - B. neurally
 - C. humorally
 - D. negatively

5. The lengthened absolute refractory period observed during action potentials in cardiac muscle is due to the presence of _____ in the cytosol.
 - A. Na^+
 - B. K^+
 - C. cAMP
 - D. Ca^{++}

6. Steroid hormones are synthesized from:
 - A. phospholipids.
 - B. cholesterol.
 - C. hemoglobin.
 - D. adenylate cyclase.

7. Which of the following heart chambers has the thickest myocardium?
 - A. left atrium
 - B. left ventricle
 - C. right atrium
 - D. right ventricle

8. The hormone insulin triggers the uptake of glucose into target cells and storage of this glucose as:

- A. glucagon.
- B. starch.
- C. aldosterone.
- D. glycogen.

9. The amount of blood that remains in the ventricles following contraction is called the:

- A. isovolume.
- B. end diastolic volume.
- C. arterial volume.
- D. end systolic volume.

10. The downregulation of receptors in a target cell occurs when:

- A. the hormone is in excess concentration.
- B. the cell becomes permanently stimulated.
- C. the hormone is absent.
- D. none of the above.

11. The heart's intrinsic rhythm is determined by:

- A. the fibrous skeleton of the heart.
- B. the autorhythmic cells of the sinoatrial (SA) node.
- C. desmosomes.
- D. the concentration of Ca^{++} in the cytosol.

12. Signaling by steroid hormones involves:

- A. activation of phospholipase C.
- B. production of cyclic AMP (cAMP).
- C. stimulation of G_i proteins.
- D. transcription of genes.

13. The lining of the pericardial cavity is called the:

- A. serous pericardium.
- B. visceral pericardium.
- C. myocardium.
- D. endocardium.

14. Uterine stretching during labor is stimulated by:

- A. prolactin.
- B. antidiuretic hormone.
- C. corticotropin.
- D. oxytocin.

15. Blood from the coronary circulation returns to the _____ of the heart.

- A. right atrium
- B. right ventricle
- C. left ventricle
- D. pulmonary trunk

16. Peptide hormones are composed of:

- A. glucose.
- B. amino acids.
- C. phospholipids.
- D. IP_3 .

17. Blood fills the ventricles by gravity while the atria are in their:

- A. systole.
- B. diastole.
- C. refractory period.
- D. tetanus.

18. Which of the following describes how blood flows through a portal system?

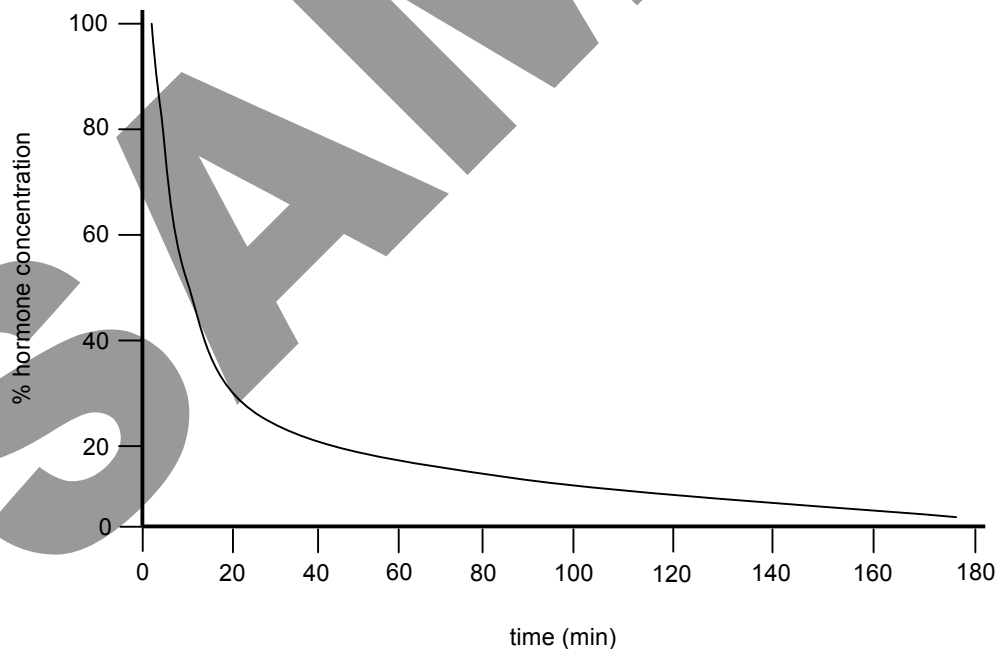
- A. artery \rightarrow capillary bed \rightarrow vein
- B. vein \rightarrow capillary bed \rightarrow artery
- C. cell body \rightarrow axon \rightarrow infundibulum \rightarrow pituitary
- D. artery \rightarrow capillary bed \rightarrow vein \rightarrow capillary bed \rightarrow vein

19. The cardioacceleratory and cardioinhibitory centers of the autonomic nervous system are located in the:

- A. spinal cord.
- B. medulla oblongata.
- C. cerebral cortex.
- D. hypothalamus.

20. The graph below illustrates the concentration of a hormone in the blood over a period of three hours. Based on the graph, what is the half-life ($T_{1/2}$) of this hormone?

- A. 12 min
- B. 30 min
- C. 90 min
- D. 175 min



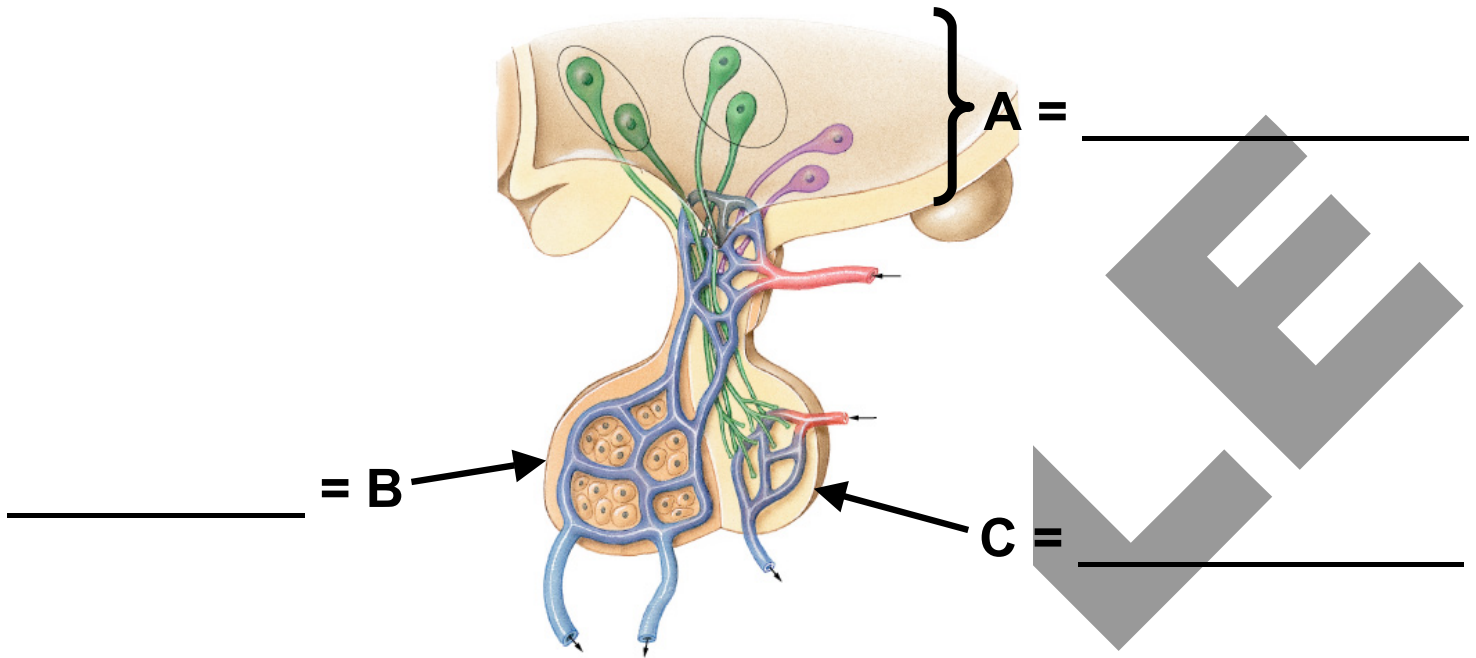
Fill-in-the-blanks. Complete each of the following statements with either the word **INCREASES** or the word **DECREASES**. (6 pts each)

21. An increase in stroke volume _____ cardiac output.
22. Activation of parasympathetic nerve fibers _____ heart rate.
23. Stretching of cardiac muscle fibers _____ end systolic volume (ESV).
24. A decrease in venous pressure _____ stroke volume.
25. Epinephrine from the adrenal medulla _____ cardiac output.
26. An increase in ESV _____ stroke volume.
27. An increase in arterial pressure _____ ESV.
28. A decrease in contractility _____ the force of ventricular contraction.
29. A decrease in heart rate _____ end diastolic volume (EDV).

Oh, one more easy one!

30. A decrease in the amount of circulating glucose _____ the production of glucagon.

Use the figure below to answer the following questions.



31. Identify the labeled structure in the figure above (5 pts each).

32. What type of tissue is found in the structure labeled B? _____ (5 pts)

33. What type of tissue is found in the structure labeled C? _____ (5 pts)

34. Where are the following hormones released from? (circle your answer; 5 pts each)

antidiuretic hormone (ADH)

B **C**

adrenocorticotrophic hormone (ACTH)

B **C**

growth hormone

B **C**

37. When the molecule of LH arrives in the testis, it will interact with Cell B via a receptor. Based on what you know about the biochemical structure of hormones like LH, where will the LH receptor be located? Why? (14 pts)

38. Cell C will bind to and respond to testosterone. Based on what you know about the biochemical structure of testosterone, where will the receptor for testosterone be located? Why? (14 pts)

39. A key structural difference between skeletal and cardiac muscle is the presence of intercalated discs in cardiac muscle. Describe the structure of an intercalated disc and explain why the discs are crucial for the proper functioning of the heart (12 pts).

SAMPLE