

Cardiovascular System – Difficult MCQs (40 Questions)

1. Which statement best explains the role of the cardiovascular system in maintaining homeostasis?

- A. Regulating digestive enzyme secretion
- B. Pumping blood to deliver nutrients and remove metabolic wastes
- C. Producing hormones for body regulation
- D. Controlling skeletal muscle contraction

2. The mediastinum is best described as the region:

- A. Between the lungs from sternum to vertebral column
- B. Between diaphragm and abdominal cavity
- C. Between heart and liver
- D. Between lungs and diaphragm only

3. Which chamber directly pumps blood into the pulmonary circulation?

- A. Left atrium
- B. Right atrium
- C. Right ventricle
- D. Left ventricle

4. The systemic circulation begins when blood leaves the:

- A. Right ventricle
- B. Pulmonary artery
- C. Left ventricle
- D. Left atrium

5. Which chamber receives oxygenated blood returning from the lungs?

- A. Right atrium
- B. Left atrium
- C. Right ventricle
- D. Pulmonary trunk

6. The outermost layer of the heart wall that is also part of the visceral pericardium is the:

- A. Endocardium
- B. Myocardium
- C. Epicardium
- D. Fibrous pericardium

7. Which layer of the heart is primarily responsible for generating the contractile force required for blood pumping?

- A. Endocardium
- B. Epicardium
- C. Myocardium
- D. Pericardium

8. The endocardium is continuous with:

- A. Pericardial fluid
- B. Endothelium of blood vessels
- C. Skeletal muscle fibers
- D. Connective tissue of myocardium

9. Which feature distinguishes cardiac muscle cells from skeletal muscle cells?

- A. Absence of sarcomeres
- B. Multiple nuclei
- C. Presence of intercalated discs
- D. Lack of aerobic metabolism

10. Desmosomes in intercalated discs mainly function to:

- A. Generate electrical impulses
- B. Prevent muscle fatigue
- C. Transmit mechanical tension between cells
- D. Produce ATP

11. Gap junctions in cardiac muscle primarily allow:

- A. Transmission of electrical impulses between cells
- B. Storage of calcium ions
- C. Mechanical attachment
- D. Nutrient transport from blood

12. The ability of the heart to generate its own electrical impulses without nervous stimulation is known as:

- A. Contractility
- B. Conductivity
- C. Autorhythmicity
- D. Excitability

13. Autorhythmic fibers differ from contractile fibers mainly because they:

- A. Generate spontaneous action potentials
- B. Produce stronger contractions

- C. Contain more mitochondria
- D. Lack electrical activity

14. The pericardial cavity is located:

- A. Inside the myocardium
- B. Between visceral and parietal pericardium
- C. Between myocardium and endocardium
- D. Inside the ventricles

15. Which condition allows atrioventricular valves to open?

- A. Ventricular pressure exceeds atrial pressure
- B. Atrial pressure exceeds ventricular pressure
- C. Pulmonary pressure exceeds ventricular pressure
- D. Ventricular contraction begins

16. During ventricular contraction, atrioventricular valves close primarily to:

- A. Prevent blood entry into ventricles
- B. Prevent backflow into atria
- C. Increase cardiac output
- D. Increase atrial pressure

17. Chordae tendineae mainly function to:

- A. Open valves actively
- B. Prevent valve prolapse during ventricular contraction
- C. Increase atrial pressure
- D. Close semilunar valves

18. Papillary muscles contract in order to:

- A. Pump blood into arteries
- B. Prevent eversion of AV valve cusps
- C. Increase ventricular filling
- D. Generate electrical impulses

19. Which valve prevents backflow from the pulmonary artery into the heart?

- A. Tricuspid valve
- B. Mitral valve
- C. Pulmonary semilunar valve
- D. Aortic valve

20. Cardiac output is defined as the:

- A. Volume of blood pumped per minute

- B. Volume of blood in ventricles
- C. Pressure inside arteries
- D. Number of heart contractions per minute

21. Cardiac output is mathematically expressed as:

- A. $CO = HR \div SV$
- B. $CO = HR \times SV$
- C. $CO = SV \div HR$
- D. $CO = MAP \times HR$

22. Stroke volume refers to:

- A. Blood pumped per heartbeat
- B. Total blood volume in body
- C. Blood pressure in arteries
- D. Blood returning to atria

23. Mean arterial pressure (MAP) is calculated approximately as:

- A. Systolic pressure + diastolic pressure
- B. Diastolic pressure + 1/3 pulse pressure
- C. Systolic pressure \div diastolic pressure
- D. Pulse pressure \div 3

24. Pulse pressure refers to the difference between:

- A. MAP and diastolic pressure
- B. Systolic and diastolic pressures
- C. Heart rate and stroke volume
- D. Cardiac output and MAP

25. The P–Q interval on an ECG represents:

- A. Ventricular repolarization
- B. Conduction from atria to ventricles
- C. Ventricular contraction
- D. Atrial relaxation

26. The QRS complex represents:

- A. Atrial repolarization
- B. Ventricular depolarization
- C. Ventricular relaxation
- D. Atrial contraction

27. The T wave corresponds to:

- A. Atrial depolarization
- B. Ventricular repolarization
- C. Ventricular contraction
- D. Atrial excitation

28. The S–T segment represents the period when:

- A. Ventricles are fully depolarized
- B. Atria are depolarized
- C. Ventricles begin repolarization
- D. Atria begin contraction

29. The Q–T interval represents:

- A. Duration of atrial contraction
- B. Entire ventricular electrical activity
- C. AV node delay
- D. Time of atrial repolarization

30. Which nervous system division increases heart rate?

- A. Parasympathetic
- B. Somatic
- C. Sympathetic
- D. Enteric

31. Parasympathetic stimulation typically causes:

- A. Increased heart rate
- B. Decreased heart rate
- C. Increased cardiac output
- D. Increased blood pressure

32. Which ion in high concentration can significantly depress cardiac function?

- A. Sodium
- B. Potassium
- C. Chloride
- D. Magnesium

33. Calcium ions in cardiac muscle mainly influence:

- A. Membrane permeability
- B. Strength of contraction
- C. Heart location
- D. Valve opening

34. Capillaries are specialized for:

- A. Rapid blood propulsion
- B. Gas and nutrient exchange
- C. Valve regulation
- D. Electrical conduction

35. The apex of the heart is located in the:

- A. Superior mediastinum
- B. Inferior mediastinum
- C. Posterior mediastinum
- D. Anterior mediastinum

36. The base of the heart is primarily located in the:

- A. Superior mediastinum
- B. Inferior mediastinum
- C. Abdominal cavity
- D. Pleural cavity

37. Which structure lines the pericardial sac?

- A. Visceral pericardium
- B. Parietal pericardium
- C. Endocardium
- D. Myocardium

38. The main function of the pulmonary circuit is to:

- A. Deliver nutrients to tissues
- B. Supply blood to digestive organs
- C. Exchange gases in the lungs
- D. Regulate blood pressure

39. Systemic circulation primarily supplies blood to:

- A. Only the brain
- B. Only the lungs
- C. The entire body except lungs
- D. Only abdominal organs

40. Which characteristic best explains the lifelong rhythmic beating of the heart?

- A. Continuous neural stimulation
- B. Skeletal muscle control
- C. Intrinsic electrical activity of autorhythmic cells
- D. Hormonal regulation only

Answer Key

1. B
2. A
3. C
4. C
5. B
6. C
7. C
8. B
9. C
10. C
11. A
12. C
13. A
14. B
15. B
16. B
17. B
18. B
19. C
20. A
21. B
22. A
23. B
24. B
25. B
26. B
27. B
28. A
29. B
30. C
31. B
32. B
33. B
34. B
35. B

36. A

37. B

38. C

39. C

40. C