University of Constantine 3 – Salah Boubnider
Faculty of Medicine. Department of Medicine
Department of General Anatomy. Second-Year Medical Students

Constantine, November 29, 2026

Written Examination in the Cardiorespiratory Unit | Duration: 2 hours 15 minutes

General Anatomy Examination

Select the correct answer.

1. The zygapophyses are:

A. The articular processes of the vertebrae, with 2 processes for each vertebra.
B. The two transverse processes and the spinous process of a thoracic vertebra.
C. Articular processes that participate in the articulation between two adjacent vertebrae.
D. The articular surfaces of a true rib.
E. Processes that form the uncovertebral joints.

2. The intercostal neurovascular bundle runs:

A. In the groove along the superior border of the ribs, outside the intercostal muscles.
B. In the costal groove, between the external and internal intercostal muscles.
C. In the middle of the intercostal space, in the subcutaneous tissue.
D. Between the intercostal muscles and the endothoracic fascia.
E. In the costal groove, between the internal and innermost intercostal muscles.

3. The left border of the cardiac silhouette includes:

A. The left superior arch: it is the trunk of the pulmonary artery and the left auricle.
B. The left middle arch: it corresponds to the aortic knob or aortic arch.
C. The left inferior arch: it corresponds to the left ventricle.
D. The right inferior arch: it is the superior vena cava (SVC).
E. The right superior arch: it corresponds to the right atrium and to the inferior vena cava.

4. The right atrioventricular orifice of the heart is equipped with a valvular apparatus, that includes the following leaflets:

A. Two posterior, right and left, and one anterior.
B. One internal, large or right, and one external, small or left.
C. Two anterior, right and left, and one posterior.
D. One anterior, one inferior, and one internal.
E. One posterior, one inferior, and one internal.

5. The transverse pericardial sinus (of Theile) is characterized by:

A. It is located between the atria and the ventricles.
B. Its posterior boundary is formed by the ascending aorta and the pulmonary trunk.
C. It connects the right and left regions of the pericardial cavity.
D. Bounded by the four pulmonary veins.
E. Its right ostium is located between the pulmonary trunk and the superior vena cava.

6. The left surface of the heart is in relation with:

A. The esophagus. B. The pleura, the left lung, and the left phrenic nerve.
C. The pleura, the left lung, and the left vagus nerve.
D. Pleurae, the lungs, the thymus or its remnants. E. The internal thoracic vessels.

7. A patient presents with acute chest pain. Coronary angiography reveals an obstruction of the left marginal artery. Which cardiac complication is associated with this obstruction?

A. Lateral myocardial infarction. B. Infarction involving the anterior third of the interventricular septum.
C. Infarction of the interatrial septum. D. Obstruction of the coronary sinus.
E. Infarction of the left atrium.

8. The vein that runs in the inferior part of the right coronary sulcus is called:

A. The great cardiac vein. B. The coronary sinus. C. The middle cardiac vein.
D. The small cardiac vein. E. The vein of Gallien.

9. What is the anatomical course of the atrioventricular bundle (bundle of His)?

A. Within the interatrial septum. B. Within the coronary sulcus.
C. Within the atrioventricular septum, then within the interventricular septum.
D. Within the septomarginal trabecula. E. Within the interventricular sulcus.

University Constantine 03 – Faculty of Medicine – Department of Medicine

Department of Histology, Embryology and Clinical Genetics

Module Examination in Histology – 2nd Year Medicine

Cardiorepiratory unit and hematopoietic organs

The date: 29/10/2026

Answer the following questions by choosing ONLY ONE correct answer:

21/- Cardiomyocytes of the myocardium are characterized by:

A. An absence of striations
B. Always peripherally located nuclei
C. A branched shape and a generally centrally located nucleus
D. Multiple nuclei per cell
E. An absence of intercellular junctions

22/- The coronary arteries are mainly located in :

A. The lumen of the ventricles
B. The endocardium
C. The connective tissue of the epicardium
D. The heart valves
E. Only in the fibrous pericardium

23/-Damage to the vascular endothelium exposes the subendothelial connective tissue to:

A.A decrease in platelet aggregation.
B.Inhibition of thrombus formation.
C.An increase in vasodilation only.
D.Platelet aggregation, which may lead to thrombus formation.
E.Disappearance of the smooth muscle fibers of the tunica media.

24/-Regarding elastic arteries, which statement is correct?

A.Their tunica media is mainly composed of circularly arranged smooth muscle fibers.
B.They are mainly located far from the heart.
C.Their tunica media contains several dozen concentric elastic lamellae.
D.They have a very clearly visible internal elastic lamina.
E.Their tunica adventitia is the thickest layer of the vessel wall.

25/-Regarding major lymphatic trunks, which statement is correct?

A. Their wall is thicker than that of a vein of the same caliber.
B. Their intima is devoid of valves.
C. Their media is mainly composed of smooth muscle fibers.
D. Lymph reflux is very frequent due to the absence of valves.
E. They open directly into the subclavian artery without passing through lymph nodes.

26/-At the level of bronchioles proper:

A. Goblet cells are numerous.
B. Cartilaginous plates and bronchial glands are absent.
C. The muscle of Reisseissen is highly developed.
D. The lamina propria is thin and contains no trace of lymphoid tissue.
E. The lining epithelium is pseudostratified columnar.

34/- A section shows lobules with communicating medullae, Hassall's corpuscles, continuous capillaries,and exclusively efferent lymphatic vessels. It is :

A. A lymph node. B. The spleen. C. The bone marrow.
D. A secondary lymphoid organ. E. The thymus.

35/-Regarding the splenic white pulp, which statement is correct?

A. It represents the entire splenic parenchyma.
B. It consists exclusively of venous sinuses.
C. It includes the periarteriolar lymphoid sheath and the Malpighian corpuscles.
D. The periarteriolar lymphoid sheath is a B-lymphocyte-dependent zone.
E. The Malpighian corpuscles contain no lymphocytes.

36/-Concerning the central artery of spleen:

A. It is devoid of surrounding lymphoid tissue.
B. It is located exclusively in the red pulp.
C. It corresponds to a vein arising from the cords of Billroth.
D. It directly gives rise to the splenic vein.
E. It corresponds to the follicular artery that passes through the Malpighian corpuscle.

37/-Through which structure does afferent lymph first enter the parenchyma of the lymph node?

A.Lymph node hilum B.Trabecular sinus C.Corticalsinus
D.Subcapsular or marginal sinus E.Medullary sinus

38/-Among the following structures, which one is not observed in a section of the nasopharynx?

A.Striated muscle bundles B.Dense lymphoid aggregates (MALT)
C.Seromucous glands D.Sebaceous glands
E.Ciliated pseudostratified epithelium

39/-Among the following characteristics concerning the histology of the oropharynx, which one is false?

A.The mucosa is lined with a non-keratinized stratified squamous epithelium
B.Presence of mucous and mixed salivary glands in the lamina propria
C.Skeletal striated muscle bundles
D.Presence of dense lymphoid tissue (palatine tonsil) in the lamina propria
E.The mucosa is lined with a respiratory epithelium

40/-Which are the most developed and well-individualized tonsils of Waldeyer's ring?

A. Palatine tonsils (located between the pillars of the soft palate).
B. Lingual tonsils. C. Peyer's patches.
D. Solitary lymphoid follicles. E. Tubal tonsils.

A. The pleura
B. The sternum
C. The scalene
D. The cartilaginous rings of the trachea
E. Bronchial smooth muscle

47.Regarding ventilation, from a physiological perspective and under static conditions, the focus is on the study of:

A. Ventilatory flow rates
B. Bronchial resistances
C. Factors determining bronchial caliber
D. Effects of surfactant
E. Tissue frictional forces

48. During inspiration, which of the following is observed?

A- A decrease in venous return
B - An increase in right ventricular end-diastolic volume
C- A decrease in right ventricular preload
D - An increase in venous tone
E- An increase in right atrial pressure

49. During muscular exercise, the decrease in afterload is explained by:

A- An increase in venoconstriction
B- Vasodilation of the arterioles in the active muscles
C- Marked parasympathetic stimulation
D- A decrease in right atrial pressure
E- A decrease in sinus automaticity

50. In the setting of arterial hypotension, what is the primary baroreflex response?

A. Stimulation of baroreceptors with activation of the vagus nerve.
B. Inhibition of the medullary vasomotor center.
C. Decrease in heart rate and stroke volume.
D. Generalized arteriolar vasodilation.
E. Removal of inhibition of the vasomotor center, with sympathetic activation.

51. Which of the following mechanisms stimulates renin secretion by the juxtaglomerular apparatus?

A. Increased wall tension of the afferent arteriole.
B. Increased NaCl concentration at the macula densa.
C. Decreased wall tension of the juxtaglomerular cells in the afferent arteriole.
D. Elevation of mean arterial pressure.
E. Direct inhibition of juxtaglomerular cells by angiotensin II.

52. Overall, in the systemic venous circulation:

A- The velocity of blood flow in the veins is lower than that in the corresponding arteries
B- The venous blood volume is equal to the arterial blood volume
C- The peripheral venous pressure is equal to the pressure at the arteriolar level
D- Venous flow is greater than arterial flow
E- Transmural pressure is stable

53. Venous return is hindered by:

A- Decreased intra-abdominal pressure
B- Contraction of the right ventricle
C- The plantar venous sole
D- Positive transmural pressure
E.Deep inspiration

54.During deep sleep, stages 2 and 3, there is a decrease in:

A- CO2 production
B- Bulbar automatic activity

C- Pulmonary volumes D- Chemoreceptor sensitivity
E- Bronchial smooth muscle activity

55 .During REM sleep, the following is observed:

A- Stability of cardiovascular activity
B- Exaggerated muscular activity
C- Regularity of the ventilatory rhythm
D- Decreased ventilatory response to hypoxia
E- An advancement of the ventilatory threshold

56.Why does CO_2 get out with a gradient of only 6 mmHg? Because

A. CO_2 is lighter than O_2
B. CO_2 is ≈ 24× more soluble, so its diffusion constant is ≈ 20× that of O_2
C. the capillary transit time is longer for CO_2
D. the membrane is thinner for CO_2
E. Same equilibrium time (0.25 s), a tenth of the gradient.

57. Pulmonary compliance is the physical property that determines:

A: Airway resistance
B: Pulmonary retraction
C: Pulmonary volumes
D: Expiration at rest
E: Gas exchange

58. The genesis of the respiratory rhythm is ensured by:

A: The pneumotaxic center
B: The apneustic center
C: The pre-Bötzinger complex
D: The limbic system
E: The reticular formation of the medulla

59. The cortex is involved in respiration:

A: During emotions
B: During sleep
C: Voluntarily
D: Superficially
E: At rest

60. Central chemoreceptors are much more stimulated by:

A: Oxygen
B: H^+ ion
C: Bicarbonates
D: Carbonic acid
E: Ventilatory flow

8' (suite physiologie)

Q_{66}: In the blood circulation:

A/ Blood is an ideal solution.

B/ Blood is a Newtonian fluid in small vessels.

C/ Red blood cells aggregate along the central axis of the vessel when the shear rate is low.

D/ An increase in viscosity causes circulatory slowing.

E/ Arterioles contribute little to total resistance.

Q_{67}: The action of a wall on a liquid allows us to state that:

A/ the pressure of the liquid is higher than that of the air in the case of a non-wetting liquid.

B/ At equilibrium, Laplace's law is written $P = A/r$ for a spherical surface.

C/ The pressure difference between the inside and the outside of a spherical liquid bubble decreases with altitude.

D/ In a capillary tube, the rise of the liquid depends only on the nature of the fluid.

E/ Blood pressure (P_{blood}) is higher than air pressure (P_{air}) in the case of a capillary embolism.

Q_{68}: The nature of the flow is described by the value of the Reynolds number. The latter:

A/ remains constant when the flow regime is laminar

B/ is greater than 2000 when the flow regime is turbulent

C/ depends on the length of the vessel

D/ depends on time

E/ None of the stated propositions is correct.

Q_{69}: The biophysics of the vascular wall shows that:

A/ tension depends on the radius in all fibres.

B/ Hooke's law applies when the increase in length is linear.

C/ Young's modulus of elasticity is homogeneous to the product of energy × volume.

D/ Surface tension and the elastance of the film do not have the same unit.

E/ None of the stated propositions is correct.

Q_{70}: The tension–radius diagram of vascular walls shows that:

A/ equilibrium of the inner surface of the aortic arch can only be reached if $T(r) = r.P$

B/ in the case of an elastic artery, the overpressure can be balanced by a stable equilibrium position.

C/ the value of Young's modulus of collagen is low.

D/ in the case of a musculo-elastic artery, only the equilibrium point corresponding to the smallest radius is stable.

E/ None of the stated propositions is correct.