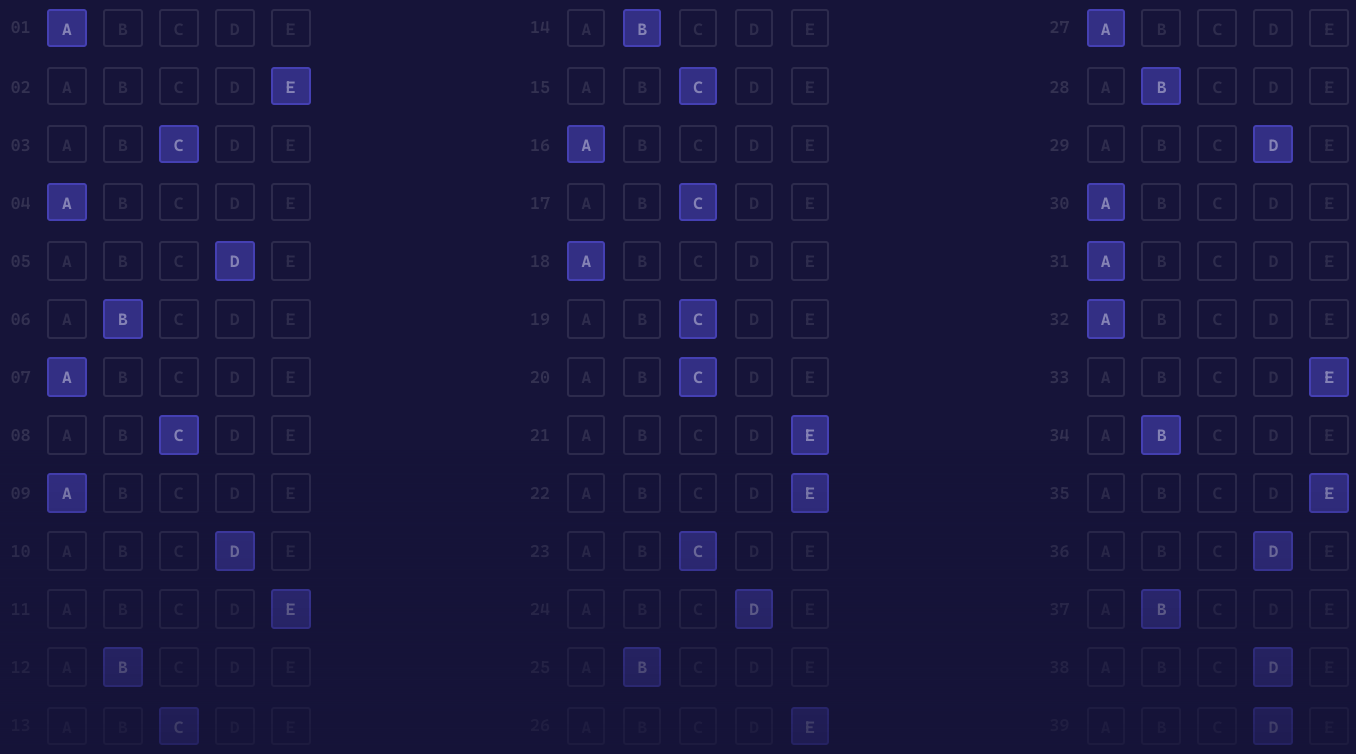
MOMETRIX
SMARTER PREP. BETTER RESULTS.



PRACTICE QUESTIONS

TTBU - The Testing Board Ukraine

1MDFR

Krok 1 Medicine (French) & English Proficiency

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

WEB www.mometrix.net

SUPPORT support@mometrix.net

Before you begin

What this is

9 practice questions for TTBU - The Testing Board Ukraine `1MDFR`, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, `1MDFR`
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

mometrix.net

QUESTION 1 SINGLE CHOICE

A 45-year-old patient develops sudden complete heart block after an anterior myocardial infarction. Occlusion of which coronary artery is most likely responsible for this complication?

A Right coronary artery

B Left circumflex artery

C Left anterior descending artery

D Posterior descending artery

ANSWER C

WHY The left anterior descending (LAD) artery supplies the anterior interventricular septum, including the bundle branches. Proximal LAD occlusion classically produces new right bundle branch block with left anterior fascicular block, and can progress to complete heart block due to ischemia of the bundle branches.

QUESTION 2 SINGLE CHOICE

A patient with chronic obstructive pulmonary disease has a PaO2 of 50 mmHg and a PaCO2 of 55 mmHg. Which component of the oxygen-carrying capacity of blood is most directly affected by the low PaO2?

A Hemoglobin concentration

B Oxygen saturation of hemoglobin

C Total oxygen content

D Oxygen-carrying capacity of hemoglobin

ANSWER B

WHY PaO2 reflects the partial pressure of oxygen dissolved in plasma, which determines the oxygen saturation of hemoglobin according to the oxyhemoglobin dissociation curve. Hemoglobin concentration and carrying capacity are properties of the hemoglobin molecule itself and are not affected by PaO2, although total oxygen content depends on all of these factors.

mometrix.net

QUESTION 3 SINGLE CHOICE

Microscopic examination of a lung biopsy shows alveolar spaces filled with red blood cells, hemosiderin-laden macrophages, and fibroblasts. Which pathological process is most consistent with these findings?

A Acute pulmonary edema

B Pulmonary infarction

C Chronic pulmonary congestion (induration)

D Diffuse alveolar damage

ANSWER C

WHY Chronic pulmonary congestion, typically due to left-sided heart failure, leads to 'brown induration' of the lung: alveolar capillaries are engorged, and red cells escape into alveoli where they are phagocytosed by macrophages that become hemosiderin-laden ('heart failure cells'). Fibroblast proliferation produces interstitial fibrosis and the firm, brown appearance of the lung.

QUESTION 4 SINGLE CHOICE

In a patient with severe bronchial asthma, arterial blood gas analysis shows PaO2 60 mmHg, PaCO2 25 mmHg, and pH 7.50. How should this acid-base status be classified?

A Compensated metabolic alkalosis

B Acute respiratory alkalosis

C Acute respiratory acidosis

D Combined metabolic and respiratory alkalosis

ANSWER B

WHY The low PaCO2 (25 mmHg) indicates a respiratory alkalosis, and the elevated pH (7.50) shows it is uncompensated. In acute asthma, hypoxemia and stimulation of lung irritant receptors cause hyperventilation and 'blowing off' of CO2. With a brief acute process, renal compensation (which would lower bicarbonate) has not yet had time to develop, hence the alkalemic pH.

QUESTION 5 SINGLE CHOICE

A patient with severe heart failure is started on an ACE inhibitor. Which mechanism best explains the improvement in cardiac output seen with this class of drugs?

A Direct positive inotropic effect on the myocardium

B Reduction of both preload and afterload through decreased angiotensin II formation

C Selective increase in renal blood flow without systemic vascular effects

D Blockade of beta-1 adrenergic receptors in the heart

ANSWER B

WHY ACE inhibitors block conversion of angiotensin I to angiotensin II, reducing vasoconstriction (afterload) and aldosterone-mediated sodium/water retention (preload). Lowering both preload and afterload improves forward cardiac output. They do not act as direct inotropes or beta-blockers.

QUESTION 6 SINGLE CHOICE

A sputum sample from a patient with suspected pulmonary tuberculosis is processed using the Ziehl-Neelsen stain. Which feature of Mycobacterium tuberculosis explains why this staining method is required?

A It produces a thick polysaccharide capsule that resists Gram staining

B It lacks a cell wall and therefore does not retain Gram stain

C Its high lipid (mycolic acid) content makes it acid-fast

D It is an intracellular parasite that must be visualized within macrophages

ANSWER C

WHY Mycobacteria possess a waxy cell wall rich in mycolic acids, which makes them acid-fast: once stained with carbol fuchsin, they resist decolorization with acid-alcohol. The Ziehl-Neelsen stain exploits this property, allowing the red bacilli to be seen against a blue counterstain.

mometrix.net

QUESTION 7 SINGLE CHOICE

A patient loses approximately 1,500 mL of blood during surgery. Which class of immediate compensatory response is primarily responsible for maintaining arterial blood pressure in the first few minutes?

A Renal retention of sodium and water

B Release of erythropoietin from the kidneys

C Baroreceptor-mediated sympathetic reflex with vasoconstriction and tachycardia

D Cushing reflex from cerebral ischemia

ANSWER C

WHY Acute blood loss of this magnitude triggers the baroreceptor reflex: decreased stretch of carotid sinus and aortic arch receptors reduces parasympathetic and increases sympathetic outflow, causing tachycardia, arteriolar vasoconstriction, and venoconstriction. This rapidly restores arterial pressure. Renal sodium retention and erythropoiesis operate over hours to days; the Cushing reflex is a late response to severely raised intracranial pressure.

QUESTION 8 TRUE FALSE

Vitamin K is required for the gamma-carboxylation of glutamate residues on coagulation factors II, VII, IX, and X, as well as proteins C and S.

A True

B False

ANSWER A

WHY True. Vitamin K is the essential cofactor for gamma-glutamyl carboxylase, which carboxylates specific glutamate residues on factors II, VII, IX, and X and on anticoagulant proteins C and S. Without this post-translational modification, these factors cannot bind calcium and phospholipid surfaces, leading to impaired coagulation, as seen in warfarin therapy and vitamin K deficiency.

QUESTION 9 MULTIPLE CHOICE

Which of the following are characteristic morphological features of acute hemorrhagic (red) infarction? (Choose two.)

A **Typically occurs in organs with dual (collateral) blood supply such as lung and intestine**

B Most often develops in solid organs with end-arterial circulation such as kidney and spleen

C **The infarcted area is dark red and well-demarcated due to hemorrhage into the necrotic tissue**

D The necrotic tissue is typically pale yellow because red cells are excluded by the dense parenchyma

ANSWER **A · C**

WHY Red (hemorrhagic) infarcts occur in organs with loose tissue and dual/collateral blood supply (lung, small intestine) where blood can seep into the necrotic zone, producing a dark red, wedge-shaped, well-demarcated area. Pale (anemic) infarcts occur in solid organs with end-arterial circulation (kidney, spleen, heart), where dense tissue prevents red cell infiltration.

mometrix.net