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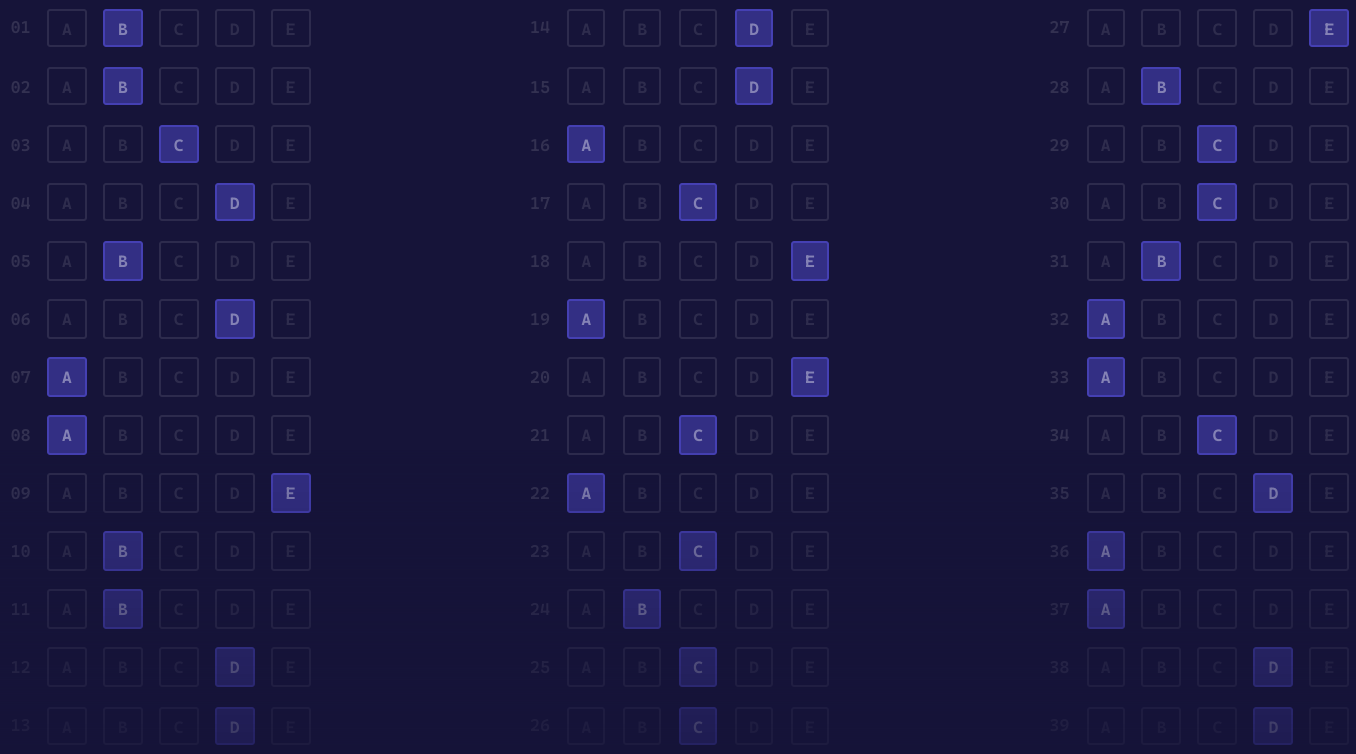

PRACTICE QUESTIONS

TTBU - The Testing Board Ukraine

1MDRU

Krok 1 Medicine (Russian) & English Proficiency

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for TTBU - The Testing Board Ukraine `1MDRU`, 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, `1MDRU`
- the question number
- the email address on your order

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

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QUESTION 1 SINGLE CHOICE

Which structure of the heart is located between the left atrium and the left ventricle?

A Tricuspid valve

B **Mitral valve**

C Aortic valve

D Pulmonary valve

ANSWER **B**

WHY The mitral (bicuspid) valve lies between the left atrium and the left ventricle. The tricuspid valve is on the right side, while the aortic and pulmonary valves are semilunar valves at the outlets of the left and right ventricles respectively.

QUESTION 2 SINGLE CHOICE

Which tissue type is characterized by cells embedded in a calcified matrix and connected by canaliculi?

A Cartilage

B **Compact bone**

C Dense regular connective tissue

D Elastic connective tissue

ANSWER **B**

WHY Compact bone tissue consists of osteocytes housed in lacunae and connected through canaliculi within a calcified matrix. Cartilage has chondrocytes in lacunae but lacks canaliculi; the connective tissues listed do not have a calcified matrix.

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QUESTION 3 SINGLE CHOICE

Activation of the parasympathetic nervous system produces which of the following effects on the heart?

A Increased heart rate and increased conduction velocity through the AV node

B Decreased heart rate and decreased conduction velocity through the AV node

C Increased contractility and vasoconstriction of coronary vessels

D No effect on heart rate but increased myocardial excitability

ANSWER B

WHY Parasympathetic stimulation via the vagus nerve releases acetylcholine at muscarinic M2 receptors, slowing the SA node firing rate (negative chronotropy) and slowing AV nodal conduction (negative dromotropy). The other options describe sympathetic or non-physiological effects.

QUESTION 4 SINGLE CHOICE

Which type of cellular adaptation is characterized by a reversible increase in the number of organelles and functional capacity of cells in response to increased workload?

A Atrophy

B Hypertrophy

C Hyperplasia

D Metaplasia

ANSWER B

WHY Hypertrophy is an increase in cell size with a rise in the number of functional organelles (e.g., cardiomyocytes responding to chronic pressure overload). Hyperplasia refers to an increase in cell number; atrophy to decreased cell size; metaplasia to replacement of one differentiated cell type by another.

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QUESTION 5 SINGLE CHOICE

In type I hypersensitivity reactions, which immunoglobulin class is bound to mast cells and mediates degranulation upon antigen exposure?

A IgG

B IgM

C IgE

D IgA

ANSWER C

WHY Type I (immediate) hypersensitivity is mediated by IgE antibodies bound to FcεRI receptors on mast cells and basophils. Cross-linking by allergen triggers degranulation and release of histamine, leukotrienes and other mediators. IgG, IgM and IgA do not bind mast cells in this fashion.

QUESTION 6 SINGLE CHOICE

A drug is administered intravenously as a single dose and follows first-order elimination kinetics with a half-life of 4 hours. Approximately what percentage of the administered dose will remain in the body 12 hours after injection?

A 50%

B 25%

C 12.5%

D 5%

ANSWER C

WHY Three half-lives (12 h / 4 h = 3) have elapsed. After each half-life, 50% of the drug remains; after three half-lives the fraction remaining is (1/2)^3 = 1/8 = 12.5%.

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QUESTION 7 SINGLE CHOICE

Which vaccine type contains living microorganisms whose pathogenicity has been attenuated so that they can replicate but cannot cause disease in immunocompetent hosts?

A Inactivated (killed) vaccine

B Toxoid vaccine

C **Live attenuated vaccine**

D Subunit (acellular) vaccine

ANSWER C

WHY Live attenuated vaccines contain weakened (attenuated) strains of the pathogen that still replicate and induce strong, long-lasting immunity. Inactivated, toxoid and subunit vaccines contain killed organisms, inactivated toxins or selected antigenic components and cannot replicate.

QUESTION 8 SINGLE CHOICE

Which enzyme catalyzes the rate-limiting step of glycolysis, the conversion of fructose-6-phosphate to fructose-1,6-bisphosphate?

A Hexokinase

B **Phosphofructokinase-1 (PFK-1)**

C Pyruvate kinase

D Glucose-6-phosphate isomerase

ANSWER B

WHY Phosphofructokinase-1 (PFK-1) catalyzes the committed, rate-limiting step of glycolysis: phosphorylation of fructose-6-phosphate to fructose-1,6-bisphosphate. Hexokinase performs the first step, and pyruvate kinase performs the last step.

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QUESTION 9 MULTIPLE CHOICE

Which of the following processes are components of pharmacokinetics? (Choose two.)

A **Absorption**

B Receptor binding

C **Distribution**

D Signal transduction

ANSWER **A** · **C**

WHY Pharmacokinetics describes what the body does to a drug through the ADME processes — Absorption, Distribution, Metabolism and Excretion. Receptor binding and signal transduction are components of pharmacodynamics (what the drug does to the body).

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