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PRACTICE QUESTIONS

Kaplan Medical In-Center Simulated Exam

K6PU1

Kaplan Step 1 Simulated Exam (2X Time / 2 Day) - In Center

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Kaplan Medical In-Center Simulated Exam **K6PU1**, 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, **K6PU1**
- the question number
- the email address on your order

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

QUESTION 1

SINGLE CHOICE

A 45-year-old man is brought to the emergency department because of confusion and profuse sweating. His serum glucose is 35 mg/dL. Which enzyme in glycolysis is most directly responsible for the rate-limiting step that, when deficient or inhibited, contributes to hypoglycemia?

- ☐ A Hexokinase
- ☒ B Phosphofructokinase-1 (PFK-1)
- ☐ C Phosphoglycerate kinase
- ☐ D Pyruvate kinase

ANSWER B

WHY PFK-1 catalyzes the committed, rate-limiting step of glycolysis (fructose-6-phosphate → fructose-1,6-bisphosphate). It is allosterically inhibited by ATP and citrate and activated by AMP and fructose-2,6-bisphosphate. Deficiency of PFK-1 (e.g., in Tarui disease) impairs glycolysis and can precipitate hemolytic anemia and, in the fed state, hypoglycemia. The other enzymes listed are not the rate-limiting glycolytic enzyme.

QUESTION 2

SINGLE CHOICE

A patient receives a drug that increases heart rate, mydriasis, and bronchodilation by inhibiting the breakdown of norepinephrine at sympathetic nerve terminals. Which drug most likely produces these effects?

- ☐ A Phenoxybenzamine
- ☐ B Physostigmine
- ☒ C Cocaine
- ☐ D Bethanechol

ANSWER C

WHY Cocaine blocks the reuptake of norepinephrine (and dopamine) by the norepinephrine transporter at sympathetic nerve terminals, increasing synaptic NE and producing sympathomimetic effects (tachycardia, mydriasis, hypertension). Phenoxybenzamine is a nonselective α -blocker; physostigmine is an acetylcholinesterase inhibitor (parasympathomimetic); bethanechol is a muscarinic agonist.

QUESTION 3

SINGLE CHOICE

A 62-year-old woman has a colonoscopy that reveals a mass in the sigmoid colon. Histology shows malignant glandular epithelium forming gland-like structures that invade the muscularis mucosae. Which of the following is the most likely molecular pathogenesis of this tumor?

- ☒ **A** APC mutation followed by KRAS mutation followed by loss of p53 (adenoma–carcinoma sequence)
- ☐ **B** Frameshift mutation in the MSH2 DNA mismatch repair gene
- ☐ **C** Translocation t(8;14) involving c-MYC
- ☐ **D** Latent Epstein–Barr virus infection of B lymphocytes

ANSWER A

WHY The described lesion is an invasive colorectal adenocarcinoma. The classic sporadic colorectal cancer sequence involves sequential mutation of APC (early adenoma), KRAS (intermediate adenoma), and p53 (carcinoma). MSH2 mutations cause Lynch syndrome but typically yield right-sided poorly differentiated mucinous tumors with lymphocytic infiltrates. t(8;14) is Burkitt lymphoma, and EBV is associated with lymphomas and nasopharyngeal carcinoma.

QUESTION 4

SINGLE CHOICE

A sputum sample from a patient with lobar pneumonia grows gram-positive, catalase-positive, optochin-resistant, bile-esculin-positive cocci in chains. Which organism is the most likely cause?

- ☐ A Streptococcus pneumoniae
- ☐ B Viridans streptococci
- ☒ C Enterococcus faecalis
- ☐ D Streptococcus pyogenes

ANSWER C

WHY Gram-positive cocci in chains that are catalase-negative distinguish streptococci/enterococci from staphylococci. Among them: *S. pneumoniae* is optochin-sensitive and bile soluble; viridans group streptococci are optochin-resistant but bile-esculin negative; *S. pyogenes* is bacitracin-sensitive (group A); *Enterococcus faecalis* is optochin-resistant and bile-esculin positive, and grows in 6.5% NaCl. The given findings fit *Enterococcus faecalis*.

QUESTION 5

SINGLE CHOICE

A 55-year-old man develops hoarseness and dysphagia after thyroidectomy. Examination shows the right vocal cord is paralyzed in the paramedian position and there is loss of sensation over the posterior one-third of the tongue on the right. Which cranial nerve has been injured?

- ☒ A Right glossopharyngeal nerve (CN IX)
- ☐ B Right hypoglossal nerve (CN XII)
- ☐ C Right recurrent laryngeal nerve
- ☐ D Right internal branch of the superior laryngeal nerve

ANSWER A

WHY The glossopharyngeal nerve (CN IX) provides sensory innervation to the posterior one-third of the tongue (taste and general sensation) and innervates the stylopharyngeus muscle. Although the recurrent laryngeal nerve injury explains hoarseness after thyroidectomy, the sensory loss over the posterior tongue localizes the lesion to CN IX. During thyroidectomy, CN IX (and especially its branches traveling with the superior thyroid artery) can be damaged along with the recurrent laryngeal nerve; the combination of findings here points to CN IX.

QUESTION 6

SINGLE CHOICE

A patient has a plasma glucose of 400 mg/dL, plasma osmolality of 320 mOsm/kg, and urine that is dipstick-negative for glucose. What is the most likely explanation?

- ☐ A Diabetes insipidus
- ☐ B Pregnancy with a low renal threshold for glucose
- ☒ C SGLT2 inhibitor therapy
- ☐ D Fanconi syndrome

ANSWER C

WHY SGLT2 inhibitors (e.g., empagliflozin, canagliflozin) block proximal tubule reabsorption of glucose, lowering the renal threshold so that glycosuria occurs at lower plasma glucose levels. With hyperglycemia exceeding the SGLT2-inhibited transport capacity, much of the filtered glucose is excreted, leading to a negative urine dipstick despite very high plasma glucose. Diabetes insipidus produces polyuria with low urine osmolality, not relevant here. Fanconi syndrome causes generalized proximal tubule dysfunction, but selective loss of glucose alone with a negative dipstick is most consistent with SGLT2 inhibition.

QUESTION 7

SINGLE CHOICE

A 32-year-old man is brought to the ED with ataxia, nystagmus, and confusion. His friends state he has been drinking heavily for 2 weeks. Six hours after admission, he develops tachycardia, hypertension, tremor, agitation, and visual hallucinations. Which drug is the most appropriate treatment for these new symptoms?

- ☐ A Flumazenil
- ☐ B Naloxone
- ☒ C Lorazepam
- ☐ D Disulfiram

ANSWER C

WHY The patient's initial findings suggest alcohol intoxication, and the new symptoms 6–24 hours after cessation indicate alcohol withdrawal. Benzodiazepines (e.g., lorazepam, diazepam, chlordiazepoxide) are first-line therapy because they enhance GABA-A activity, reducing withdrawal symptoms and preventing seizures and delirium tremens. Flumazenil reverses benzodiazepines (and would worsen withdrawal). Naloxone reverses opioids. Disulfiram is used for aversion therapy in alcohol use disorder, not acute withdrawal.

QUESTION 8

MULTIPLE CHOICE

Which of the following are features of classic phenylketonuria (PKU)? (Choose two.)

- ☒ A Autosomal recessive phenylalanine hydroxylase deficiency
- ☒ B Musty/mousy body odor
- ☐ C Increased melanin synthesis
- ☐ D Tyrosine becomes an essential amino acid

ANSWER A - B

WHY PKU is autosomal recessive due to phenylalanine hydroxylase deficiency (or, less commonly, BH4 deficiency). Excess phenylalanine is shunted to phenylketones (phenylacetate, phenyllactate, phenylpyruvate), causing a musty/mousy odor, intellectual disability, eczema, fair skin, and growth delay. Because tyrosine cannot be synthesized from phenylalanine, it becomes conditionally essential. Melanin synthesis is decreased (fair complexion), not increased, because tyrosine availability is reduced.

QUESTION 9

MULTIPLE CHOICE

Which of the following tissues are derived from neural crest cells? (Choose two.)

- ☒ **A** Adrenal medulla chromaffin cells
- ☒ **B** Odontoblasts
- ☐ **C** Pulmonary alveolar type II pneumocytes
- ☐ **D** Enteric ganglia

ANSWER A - B

WHY Neural crest derivatives include the adrenal medulla (chromaffin cells), dorsal root and autonomic ganglia, enteric (myenteric and submucosal) ganglia, Schwann cells, melanocytes, parafollicular C cells of the thyroid, odontoblasts (and dental pulp), pia and arachnoid mater, and aorticopulmonary septum. Pulmonary alveolar type II pneumocytes derive from endoderm (foregut) of the respiratory bud, not neural crest.