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PRACTICE QUESTIONS

Dubai Health Authority (DHA)

BICTH

Clinical Biochemistry - Allied

EDITION

Original Demo

QUESTIONS

15

ISSUED

October 14, 2026

Before you begin

What this is

15 practice questions for Dubai Health Authority (DHA) **BICTH**, 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, **BICTH**
- the question number
- the email address on your order

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

Licence

Original Mometrix demo. This free sample contains fewer questions than the full paid edition.

QUESTION 1

SINGLE CHOICE

Which cardiac biomarker is detectable in peripheral blood the earliest after the onset of symptoms in acute myocardial infarction?

- ☐ A Creatine kinase-MB (CK-MB)
- ☐ B Cardiac troponin T
- ☐ C Cardiac troponin I
- ☒ D High-sensitivity troponin

ANSWER D

WHY High-sensitivity troponin assays can be elevated within 1-3 hours of symptom onset, earlier than conventional troponin (4-6 hours), CK-MB (4-8 hours), and standard troponin assays. This earlier rise is why serial high-sensitivity troponin measurement is used in early rule-in/rule-out protocols.

QUESTION 2

SINGLE CHOICE

Which pre-analytical factor most commonly causes a falsely elevated serum potassium result?

- ☐ A Prolonged storage of separated serum at 4 °C before analysis
- ☐ B Collection of blood into a lithium-heparin tube
- ☒ C Haemolysis of the blood sample
- ☐ D Use of the sitting position for venous sampling
- ☐ E Recent high-carbohydrate meal before venepuncture

ANSWER C

WHY Potassium is the major intracellular cation; even mild in-vitro haemolysis releases potassium from red cells into the serum/plasma, producing a falsely (spuriously) elevated result. Prolonged storage at 4 °C can allow potassium to leak from cells, but the question specifies 'serum separated' so cells are no longer present.

QUESTION 3

SINGLE CHOICE

In a patient with acute alcoholic hepatitis, which pattern of liver enzyme elevation is most characteristic?

- ☐ A ALT > AST, with both markedly elevated (>1000 U/L)
- ☒ B AST > ALT, with AST usually below 500 U/L and an AST/ALT ratio greater than 2
- ☐ C Isolated marked elevation of gamma-glutamyl transferase (GGT) only
- ☐ D Predominant elevation of alkaline phosphatase with normal transaminases

ANSWER B

WHY Acute alcoholic hepatitis classically produces an AST:ALT ratio greater than 2:1, with AST typically below 500 U/L. This pattern reflects pyridoxal-5'-phosphate (vitamin B6) deficiency in alcoholics, which limits ALT synthesis, and mitochondrial injury from ethanol which preferentially elevates AST.

QUESTION 4

MULTIPLE CHOICE

Which of the following pre-analytical factors can falsely elevate serum potassium results? (Choose two.)

- ☒ A Prolonged tourniquet application during phlebotomy
- ☐ B Allowing the specimen to clot at room temperature for 30 minutes before centrifugation
- ☒ C Hemolysis of the red blood cells during or after collection
- ☐ D Storing separated serum at 4°C for 2 hours prior to analysis

ANSWER A - C

WHY Both prolonged tourniquet time (causing local ischemia and potassium efflux from cells) and hemolysis (releasing intracellular potassium from RBCs) are well-documented causes of pseudohyperkalemia. Allowing clotting at room temperature and short-term refrigerated storage of separated serum are standard, acceptable conditions that do not artifactually raise potassium.

QUESTION 5

SINGLE CHOICE

A patient's arterial blood gas shows: pH 7.18, pCO₂ 30 mmHg, HCO₃⁻ 12 mmol/L, pO₂ 90 mmHg. Which acid-base disturbance is present?

- ☐ A Respiratory acidosis with partial metabolic compensation
- ☐ B Metabolic acidosis with appropriate respiratory compensation
- ☒ C Metabolic acidosis with respiratory acidosis (mixed disorder)
- ☐ D Respiratory alkalosis with metabolic compensation
- ☐ E Anion gap metabolic alkalosis

ANSWER C

WHY The low pH (acidosis) with low HCO₃⁻ indicates a primary metabolic acidosis. However, the pCO₂ is lower than expected for simple compensation (expected pCO₂ $\approx 1.5 \times \text{HCO}_3^- + 8 \pm 2 = 26 \pm 2$; a value of 30 is inappropriately high when HCO₃⁻ is 12). This indicates a mixed metabolic acidosis + respiratory acidosis, commonly seen in severe cardiopulmonary collapse or cardiac arrest.

QUESTION 6

SINGLE CHOICE

A fasting lipid profile shows: total cholesterol 6.8 mmol/L, triglycerides 4.5 mmol/L, HDL-cholesterol 1.0 mmol/L. The calculated Friedewald LDL-cholesterol is invalid. What is the most likely reason?

- ☐ A The total cholesterol is too low
- ☐ B The HDL-cholesterol is too low
- ☒ C The triglycerides exceed the limit for which Friedewald equation is valid
- ☐ D The patient was not fasting

ANSWER C

WHY The Friedewald equation (LDL-C = TC - HDL-C - TG/2.2 in mmol/L) is unreliable and not validated when triglycerides exceed approximately 4.5 mmol/L (≈ 400 mg/dL) because chylomicrons and VLDL remnants interfere with the estimation of VLDL-C. In such cases, LDL-cholesterol should be measured directly.

QUESTION 7

SINGLE CHOICE

A patient has the following results: pH 7.52, pCO₂ 30 mmHg, HCO₃⁻ 24 mmol/L. Which acid-base disturbance is present?

- ☒ **A** Respiratory alkalosis with appropriate metabolic compensation
- ☐ **B** Metabolic alkalosis with respiratory compensation
- ☐ **C** Respiratory acidosis with metabolic compensation
- ☐ **D** Combined metabolic and respiratory alkalosis

ANSWER A

WHY The pH is elevated (alkalaemia), the pCO₂ is low (primary respiratory alkalosis), and the bicarbonate is normal/appropriate for the degree of hypocapnia (acute respiratory alkalosis: expected HCO₃⁻ $\approx 24 - 1 \times (40 - 30) = \sim 23$ mmol/L). The pattern is a primary respiratory alkalosis with appropriate (acute) metabolic compensation, so option A is correct.

QUESTION 8

SINGLE CHOICE

In a patient with obstructive jaundice due to a common bile duct stone, which pattern of liver enzyme results is most characteristic?

- ☐ **A** Markedly elevated ALT and AST with normal alkaline phosphatase
- ☒ **B** Markedly elevated alkaline phosphatase and GGT with mild elevation of transaminases
- ☐ **C** Isolated elevation of total bilirubin with normal enzymes
- ☐ **D** Markedly elevated LDH and CK with normal alkaline phosphatase

ANSWER B

WHY Cholestatic/obstructive patterns show disproportionate elevation of alkaline phosphatase and GGT (membrane-bound enzymes induced by bile duct obstruction) with only mild/moderate rises in the transaminases. Option B matches this pattern. Option A describes a hepatocellular pattern; option D is unrelated to liver obstruction. Therefore option B is correct.

QUESTION 9

SINGLE CHOICE

On a Levey-Jennings quality control chart, a single control value falls between ± 2 and ± 3 standard deviations from the mean. According to Westgard rules, what is the most appropriate interpretation?

- ☐ A Accept the run; no rule violation has occurred
- ☐ B Reject the run immediately under the 2:3s rule
- ☒ C Warning rule only - inspect but do not reject
- ☐ D Reject the run under the 1:3s rule

ANSWER C

WHY Westgard multi-rule QC defines ± 2 SD as the warning limit (a 'warning' rule such as 1:2s). A value between ± 2 and ± 3 SD triggers an alert for review but does not by itself reject the run. Rejection requires either a value exceeding ± 3 SD (1:3s) or additional rule violations such as 2:3s, R:4s, 4:1s, or 10:x.

QUESTION 10

SINGLE CHOICE

A patient has the following results: free T4 8 pmol/L (reference 12-22), TSH 8.5 mIU/L (reference 0.4-4.0), free T3 normal. Which condition does this pattern most likely represent?

- ☐ A Primary hyperthyroidism (Graves' disease)
- ☒ B Primary (overt) hypothyroidism
- ☐ C Sick euthyroid syndrome
- ☐ D Central (secondary) hypothyroidism

ANSWER B

WHY A low free T4 with an elevated TSH indicates failure of the thyroid gland to produce adequate hormone, with an appropriate pituitary response - the classic biochemical picture of primary overt hypothyroidism. In central hypothyroidism, TSH would be low or inappropriately normal rather than raised.

QUESTION 11

SINGLE CHOICE

A patient has the following results: serum sodium 125 mmol/L, serum osmolality 260 mOsm/kg, urine osmolality 550 mOsm/kg, urine sodium 40 mmol/L. Which diagnosis is most consistent with these findings?

- ☐ A Primary polydipsia
- ☒ B Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
- ☐ C Diabetes insipidus
- ☐ D Osmotic diuresis from hyperglycaemia

ANSWER B

WHY Hyponatraemia with low serum osmolality accompanied by inappropriately concentrated urine (urine osmolality > 100 mOsm/kg) and elevated urine sodium (>20 mmol/L) in a euvolaemic patient is the classic biochemical profile of SIADH. In primary polydipsia urine would be maximally dilute.

QUESTION 12

SINGLE CHOICE

Which troponin isoform is the preferred cardiac-specific marker currently used in clinical biochemistry laboratories for diagnosing acute myocardial infarction?

- ☒ A Cardiac troponin T (cTnT)
- ☐ B Skeletal troponin I (sTnI)
- ☐ C Cardiac troponin C (cTnC)
- ☐ D Troponin T from slow-twitch skeletal muscle

ANSWER A

WHY Cardiac troponin T (cTnT) and cardiac troponin I (cTnI) are the cardiac-specific isoforms used for MI diagnosis; cardiac troponin C is not cardiac-specific (identical to skeletal isoform). Skeletal troponin I is not used. Therefore option A is correct.

QUESTION 13

MULTIPLE CHOICE

Which of the following laboratory findings are most characteristic of diabetic ketoacidosis (DKA)? (Choose two.)

- ☒ **A Plasma glucose typically > 13.9 mmol/L (250 mg/dL)**
- ☐ **B Increased serum bicarbonate (> 30 mmol/L)**
- ☒ **C Positive serum or urine ketones**
- ☐ **D Increased arterial pH (> 7.45)**
- ☐ **E Anion gap metabolic alkalosis**

ANSWER A - C

WHY DKA is characterised by hyperglycaemia (commonly > 13.9 mmol/L), ketonaemia/ketonuria, and a high anion-gap metabolic acidosis with low bicarbonate and low pH. Increased bicarbonate, increased pH and metabolic alkalosis are inconsistent with DKA.

QUESTION 14

SINGLE CHOICE

In a patient with multiple myeloma, which finding on serum protein electrophoresis is most characteristic?

- ☐ **A A polyclonal increase in the gamma region**
- ☒ **B A narrow-based spike (M-spike) in the gamma region with decreased normal immunoglobulins**
- ☐ **C A bridge between the beta and gamma regions (beta-gamma bridging)**
- ☐ **D An absent alpha-1 band**

ANSWER B

WHY Multiple myeloma is characterized by the proliferation of a single clone of plasma cells producing one identical immunoglobulin, producing a narrow, tall, homogeneous spike in the gamma (occasionally beta) region, with suppression of the remaining normal polyclonal immunoglobulins. A polyclonal increase reflects reactive processes; beta-gamma bridging is typical of cirrhosis; absent alpha-1 suggests alpha-1 antitrypsin deficiency.

QUESTION 15

MULTIPLE CHOICE

Which of the following are characteristic findings on serum protein electrophoresis in a patient with cirrhosis of the liver? (Choose two.)

- ☒ **A** Beta-gamma bridging
- ☐ **B** A sharp, narrow-based spike in the gamma region
- ☒ **C** Decreased albumin with a polyclonal increase in the gamma region
- ☐ **D** An M-protein spike in the gamma region

ANSWER A • C

WHY Cirrhosis classically produces a polyclonal hypergammaglobulinemia and reduced albumin; the beta and gamma fractions often fuse, producing 'beta-gamma bridging' due to increased IgA. A sharp, narrow spike (M-protein) suggests monoclonal gammopathy such as multiple myeloma, not cirrhosis.