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| 02 | A | B | C | D | E |
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| 08 | A | B | C | D | E |
| 09 | A | B | C | D | E |
| 10 | A | B | C | D | E |
| 11 | A | B | C | D | E |
| 12 | A | B | C | D | E |
| 13 | A | B | C | D | E |

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| 14 | A | B | C | D | E |
| 15 | A | B | C | D | E |
| 16 | A | B | C | D | E |
| 17 | A | B | C | D | E |
| 18 | A | B | C | D | E |
| 19 | A | B | C | D | E |
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| 22 | A | B | C | D | E |
| 23 | A | B | C | D | E |
| 24 | A | B | C | D | E |
| 25 | A | B | C | D | E |
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| 27 | A | B | C | D | E |
| 28 | A | B | C | D | E |
| 29 | A | B | C | D | E |
| 30 | A | B | C | D | E |
| 31 | A | B | C | D | E |
| 32 | A | B | C | D | E |
| 33 | A | B | C | D | E |
| 34 | A | B | C | D | E |
| 35 | A | B | C | D | E |
| 36 | A | B | C | D | E |
| 37 | A | B | C | D | E |
| 38 | A | B | C | D | E |
| 39 | A | B | C | D | E |

## PRACTICE QUESTIONS

Dubai Health Authority (DHA)

# BICTH

Clinical Biochemistry - Allied

Uploaded by throwaway\_9937

EDITION

Original Demo

QUESTIONS

8

ISSUED

October 14, 2026

# Before you begin

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## What this is

8 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

Free Mometrix practice demo. The complete question bank is available through a paid account.

**QUESTION 1**

SINGLE CHOICE

A patient's arterial blood gas results are: pH 7.28,  $p\text{CO}_2$  50 mmHg,  $\text{HCO}_3^-$  27 mmol/L,  $p\text{O}_2$  80 mmHg. Which acid-base disturbance is present?

- ☒ **A** Acute respiratory acidosis
- ☐ **B** Acute respiratory alkalosis
- ☐ **C** Metabolic acidosis with respiratory compensation
- ☐ **D** Metabolic alkalosis with respiratory compensation

**ANSWER A**

**WHY** The pH of 7.28 indicates acidemia. The elevated  $p\text{CO}_2$  of 50 mmHg indicates a respiratory cause. The  $\text{HCO}_3^-$  of 27 mmol/L is only slightly elevated, consistent with an acute (uncompensated) respiratory acidosis rather than a chronic process where bicarbonate would be markedly raised.

**QUESTION 2**

SINGLE CHOICE

According to the Friedewald equation, which of the following triglyceride concentrations makes the calculated LDL-cholesterol value unreliable?

- ☒ **A** Triglycerides above 4.5 mmol/L ( $\approx 400$  mg/dL)
- ☐ **B** Triglycerides above 2.3 mmol/L ( $\approx 200$  mg/dL)
- ☐ **C** Triglycerides above 1.7 mmol/L ( $\approx 150$  mg/dL)
- ☐ **D** Triglycerides above 11.3 mmol/L ( $\approx 1000$  mg/dL)

**ANSWER A**

**WHY** The Friedewald equation ( $\text{LDL} = \text{Total cholesterol} - \text{HDL} - \text{TG}/5$  in mg/dL, or  $\text{TG}/2.2$  in mmol/L) becomes inaccurate when triglycerides exceed 4.5 mmol/L (400 mg/dL), because at this level chylomicrons and VLDL cholesterol content is no longer reliably estimated by the TG/5 factor. Direct LDL measurement is recommended in such cases.

**QUESTION 3**

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 4**

SINGLE CHOICE

In a patient with acute paracetamol (acetaminophen) overdose leading to centrilobular hepatic necrosis, which pattern of liver enzyme elevation is most typical on the second to third day after ingestion?

- ☐ A ALT and AST mildly elevated ( $<3\times$  upper limit of normal), with ALT  $>$  AST
- ☒ B ALT and AST markedly elevated ( $>10\times$  upper limit of normal), with AST  $>$  ALT initially
- ☐ C GGT and alkaline phosphatase markedly elevated, with ALT/AST near normal
- ☐ D Isolated rise in bilirubin with normal aminotransferases

**ANSWER B**

**WHY** Acetaminophen toxicity produces massive centrilobular (zone 3) hepatocellular necrosis, with dramatic elevations of AST and ALT (often  $>10\times$  ULN, sometimes  $>100\times$  ULN). Because the liver contains high AST activity and mitochondrial release is prominent in toxic injury, AST frequently exceeds ALT early, later reversing as ALT has a longer half-life. A cholestatic picture (GGT/ALP rise) or isolated hyperbilirubinaemia does not fit hepatocellular necrosis.

**QUESTION 5**

SINGLE CHOICE

A critically ill patient in the ICU has the following thyroid function tests: free T4 12 pmol/L (reference 12-22), TSH 0.8 mIU/L (reference 0.4-4.0), free T3 2.0 pmol/L (reference 3.1-6.8). Which is the most likely interpretation?

- ☐ A Primary hypothyroidism
- ☐ B Primary hyperthyroidism
- ☒ C Non-thyroidal illness (low T3 syndrome)
- ☐ D Secondary (central) hypothyroidism

**ANSWER C**

**WHY** In non-thyroidal illness (sick euthyroid syndrome), peripheral conversion of T4 to T3 is impaired, producing an isolated low free T3 with normal free T4 and a normal or slightly low TSH. In primary hypothyroidism, TSH would be elevated and free T4 low; in primary hyperthyroidism, TSH would be suppressed and free T4/T3 elevated; in central hypothyroidism, free T4 is low and TSH is inappropriately normal or low. The pattern here - isolated low T3 with otherwise near-normal TFTs in a critically ill patient - fits non-thyroidal illness.

**QUESTION 6**

SINGLE CHOICE

A patient's arterial blood gas shows: pH 7.18,  $p\text{CO}_2$  30 mmHg,  $\text{HCO}_3^-$  12 mmol/L,  $p\text{O}_2$  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  $\text{HCO}_3^-$  indicates a primary metabolic acidosis. However, the  $p\text{CO}_2$  is lower than expected for simple compensation (expected  $p\text{CO}_2 \approx 1.5 \times \text{HCO}_3^- + 8 \pm 2 = 26 \pm 2$ ; a value of 30 is inappropriately high when  $\text{HCO}_3^-$  is 12). This indicates a mixed metabolic acidosis + respiratory acidosis, commonly seen in severe cardiopulmonary collapse or cardiac arrest.

**QUESTION 7**

MULTIPLE CHOICE

Which of the following statements about serum tumour markers used in clinical biochemistry are correct? (Choose two.)

- ☒ **A** PSA is used for screening, diagnosis and monitoring of prostatic adenocarcinoma
- ☐ **B** CA 19-9 is the most useful tumour marker for screening the general population for pancreatic cancer
- ☒ **C** AFP is markedly elevated in non-seminomatous germ cell tumours (e.g. yolk-sac tumour, embryonal carcinoma)
- ☐ **D** CA 125 is highly specific for epithelial ovarian malignancy

**ANSWER** A - C

**WHY** PSA is widely used (with limitations) for screening, diagnosis and monitoring of prostatic adenocarcinoma, making statement A correct. AFP is markedly elevated in non-seminomatous germ cell tumours such as yolk-sac and embryonal carcinoma, making statement C correct. CA 19-9 lacks the sensitivity and specificity required for general population screening of pancreatic cancer, and CA 125 - although useful for monitoring epithelial ovarian cancer - can be elevated in many benign conditions (endometriosis, pelvic inflammatory disease, pregnancy, menstruation), so it is not highly specific.

**QUESTION 8**

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.