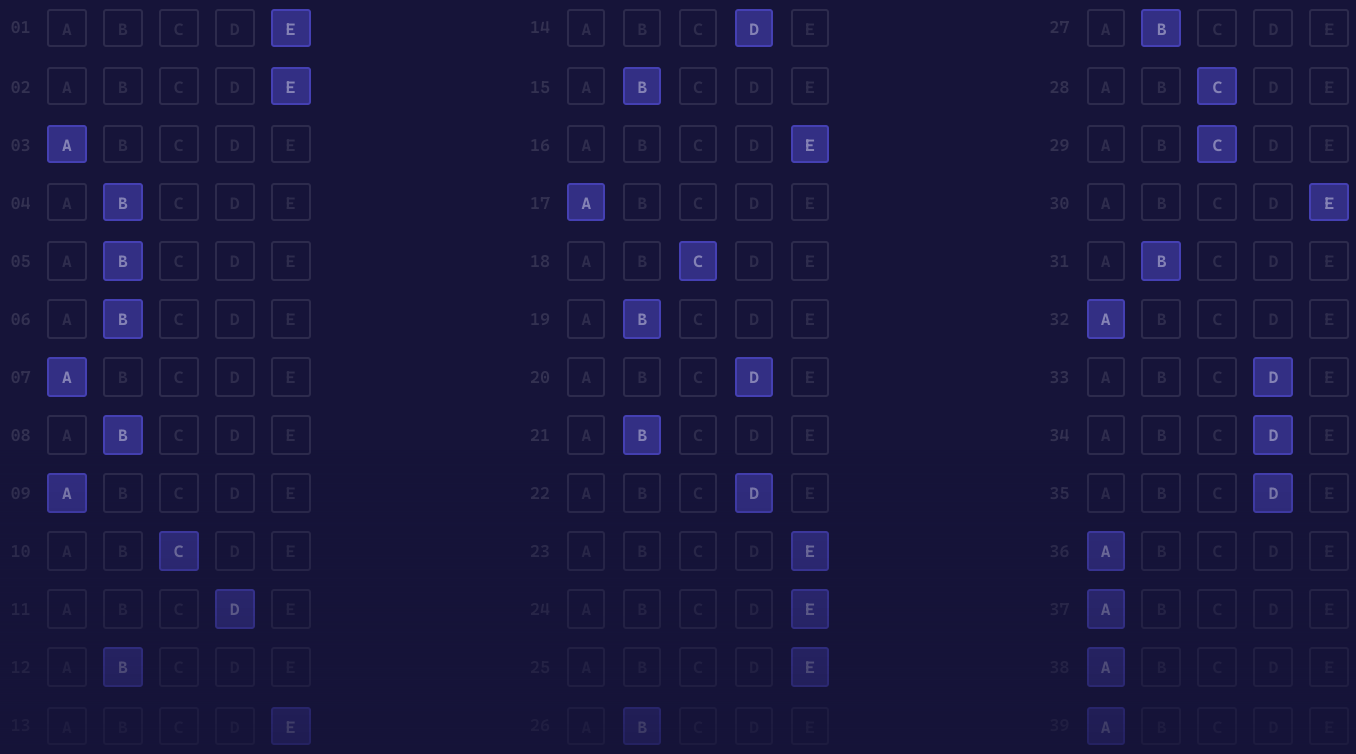
MOMETRIX
SMARTER PREP. BETTER RESULTS.



PRACTICE QUESTIONS

Saudi Commission For Health Specialties (SCFHS)

BICTH

Biochemistry Technician exams

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 Saudi Commission For Health Specialties (SCFHS) `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.

QUESTION 1 SINGLE CHOICE

A peptide bond is formed between which two functional groups?

A Two amino groups

B Two carboxyl groups

C An amino group and a carboxyl group

D Two hydroxyl groups

ANSWER C

WHY A peptide bond is an amide linkage formed by a condensation reaction between the α-amino group of one amino acid and the α-carboxyl group of another, releasing H2O. The other options describe bonds not characteristic of peptide linkage.

QUESTION 2 SINGLE CHOICE

In Michaelis–Menten kinetics, what does the Michaelis constant (Km) represent?

A The maximum reaction velocity achieved by the enzyme

B The substrate concentration at which the reaction velocity is half of Vmax

C The turnover number of the enzyme

D The dissociation constant of the enzyme–substrate complex

ANSWER B

WHY Km is defined operationally as the substrate concentration at which the initial reaction velocity equals half of Vmax. It reflects the affinity of the enzyme for its substrate (lower Km = higher apparent affinity in simple Michaelis–Menten kinetics), but it is not identical to the dissociation constant Ks, nor is it the maximum velocity or kcat.

QUESTION 3 SINGLE CHOICE

Which of the following monosaccharides is a ketose?

A Glucose

B Galactose

C Mannose

D Fructose

ANSWER D

WHY Fructose contains a ketone group at C2 and is therefore a ketohexose. Glucose, galactose, and mannose are aldohexoses with an aldehyde group at C1.

QUESTION 4 SINGLE CHOICE

In DNA, which base pairs with adenine?

A Guanine

B Cytosine

C Thymine

D Uracil

ANSWER C

WHY In double-stranded DNA, adenine pairs with thymine via two hydrogen bonds, while guanine pairs with cytosine via three hydrogen bonds. Uracil is found in RNA in place of thymine.

QUESTION 5 SINGLE CHOICE

A non-competitive inhibitor affects enzyme activity by:

A Binding to the active site and competing with the substrate

B **Binding reversibly to the enzyme at a site other than the active site**

C Increasing the Km without affecting Vmax

D Acting only when substrate concentration is very low

ANSWER **B**

WHY A non-competitive inhibitor binds to a site distinct from the active site (an allosteric site) and typically reduces Vmax while leaving Km unchanged, because its effect cannot be overcome by increasing substrate concentration. Binding to the active site describes competitive inhibition, and increasing Km without changing Vmax is characteristic of competitive inhibition, not non-competitive.

QUESTION 6 SINGLE CHOICE

Which vitamin is the precursor of the coenzyme NAD+/NADH?

A Riboflavin (vitamin B2)

B **Niacin (vitamin B3)**

C Thiamine (vitamin B1)

D Pyridoxine (vitamin B6)

ANSWER **B**

WHY NAD+ and NADP+ are derived from niacin (vitamin B3). Riboflavin is the precursor of FAD/FMN, thiamine forms TPP, and pyridoxine is converted to pyridoxal phosphate (PLP).

QUESTION 7 SINGLE CHOICE

Levey–Jennings control charts in the clinical laboratory are primarily used to monitor:

A Patient identification accuracy

B **Analytical precision of an assay over time**

C The storage temperature of reagents

D The turnaround time for reporting results

ANSWER **B**

WHY Levey–Jennings charts plot daily QC measurements against the mean and ±1, 2, and 3 standard deviations of an assay, allowing detection of shifts (changes in accuracy) and trends (changes in precision) in analytical performance. The other options are managed by different quality procedures, not by Levey–Jennings charting.

QUESTION 8 SINGLE CHOICE

The Henderson–Hasselbalch equation for the bicarbonate buffer system is:

A pH = pKa + log ([H2CO3]/[HCO3-])

B **pH = pKa + log ([HCO3-]/[H2CO3])**

C pH = pKa + log ([CO2]/[HCO3-])

D pH = pKa + log ([HCO3-]/[CO32-])

ANSWER **B**

WHY The Henderson–Hasselbalch equation is pH = pKa + log ([conjugate base]/[acid]). For the bicarbonate system, the conjugate base is HCO3- and the acid is H2CO3 (often approximated by dissolved CO2). Option A inverts the ratio, and options C and D use incorrect species.

QUESTION 9 SINGLE CHOICE

In a clinical biochemistry spectrophotometer, absorbance (A) of a solution is related to the concentration of the analyte by which law?

A **Beer–Lambert law**

B Henderson–Hasselbalch law

C Nernst equation

D Henry's law

ANSWER **A**

WHY The Beer–Lambert law states that absorbance is directly proportional to the concentration of an absorbing species and the path length of the cuvette (A = ε·b·c). It is the foundational law for quantitative spectrophotometric assays in the clinical biochemistry laboratory. Henderson–Hasselbalch applies to buffers, Nernst to electrochemistry, and Henry's law to gas solubility.