CANADIAN LAB NOTES

Clinical Chemistry Practice Pack #1: General Chemistry Sampler

CSMLS/CAMLPR-Style Practice Workbook

Format	Part 1: Exam Mode - questions only; Part 2: Review Mode - answers and rationales.
Includes	50 practice questions, answer lines, flag/confidence tracker, full rationales, bench clues, trap-answer review, and exam pearls.
Difficulty	15 Easy | 15 Moderate | 20 Hard
Best Use	Answer Exam Mode first without spoilers, then use Review Mode to study why each answer is correct or incorrect.

For Canadian MLT exam preparation. Use with current program/laboratory policy and instructor guidance.

PART 1 - EXAM MODE

Answer first without rationales. Mark anything you want to review later.

EASY QUESTIONS

Question 1

A serum potassium result is critically high. The specimen is visibly hemolyzed.
Which action is most appropriate before reporting?
A. Report the potassium with a hemolysis comment
B. Dilute the sample and repeat the potassium
C. Request recollection before reporting the result
D. Centrifuge the sample again and rerun potassium

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 2

Which electrolyte is most directly affected by hemolysis due to release from red blood cells?
A. Sodium
B. Potassium
C. Chloride
D. Bicarbonate

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 3

A patient has increased urea and increased creatinine.
Which organ system is most likely being assessed?
A. Liver
B. Kidney
C. Pancreas
D. Thyroid

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 4

Which test is most commonly used to assess long-term glycemic control?
A. Fasting glucose
B. Random glucose
C. HbA1c
D. Urine ketones

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 5

Which enzyme is most associated with cholestasis or biliary obstruction?
A. ALT
B. AST
C. ALP
D. CK

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 6

Which cardiac marker rises early after myocardial injury and is relatively cardiac-specific?

A. Troponin
B. Amylase
C. ALP
D. GGT

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 7

A patient with diabetic ketoacidosis would most likely have which acid-base pattern?

A. Metabolic alkalosis
B. Respiratory alkalosis
C. Metabolic acidosis
D. Respiratory acidosis

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 8

Which analyte is most affected by prolonged tourniquet application and hemoconcentration?

A. Total protein
B. Chloride
C. Urea
D. Creatinine

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 9

Which lipid result is commonly calculated rather than directly measured in routine lipid profiles?

A. Total cholesterol
B. HDL cholesterol
C. Triglycerides
D. LDL cholesterol

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

Question 10

Which protein is the major contributor to plasma oncotic pressure?

A. Albumin
B. Fibrinogen
C. Immunoglobulin G
D. C-reactive protein

My answer: _____ Flag: [ ] Confidence: Low / Medium / High

PART 2 - REVIEW MODE

Use this section after completing Exam Mode. The layout separates the question from the learning points so review feels less crowded.

EASY QUESTIONS

Question 1

A serum potassium result is critically high. The specimen is visibly hemolyzed.
Which action is most appropriate before reporting?
A. Report the potassium with a hemolysis comment
B. Dilute the sample and repeat the potassium
C. Request recollection before reporting the result
D. Centrifuge the sample again and rerun potassium

Answer
C. Request recollection before reporting the result

Rationale
Hemolysis releases intracellular potassium from red blood cells, which can falsely increase serum potassium. If potassium is critically high and the sample is visibly hemolyzed, the safest action is recollection before reporting a potentially misleading critical result.

Bench Clue
A serum potassium result is critically high. The specimen is visibly hemolyzed.

Trap Answer
A. Reporting with a comment may still lead to inappropriate treatment if the result is falsely critical.
B. Dilution does not correct potassium released from hemolyzed cells.
D. Recentrifugation does not remove potassium already released into serum/plasma.

Exam Pearl
Hemolyzed sample + high potassium = always think pseudohyperkalemia before panic mode.

Question 2

Which electrolyte is most directly affected by hemolysis due to release from red blood cells?
A. Sodium
B. Potassium
C. Chloride
D. Bicarbonate

Answer
B. Potassium

Rationale
Red blood cells contain a high concentration of potassium. When hemolysis occurs, intracellular potassium leaks into the serum or plasma, causing a falsely increased potassium result.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
A. Sodium is mainly extracellular and is not significantly released from red cells.
C. Chloride is not the classic hemolysis-sensitive electrolyte.
D. Bicarbonate is more affected by handling, exposure to air, and metabolic processes.

Exam Pearl
The chemistry bench loves this trap: hemolysis falsely increases potassium.

Question 3

A patient has increased urea and increased creatinine.
Which organ system is most likely being assessed?
A. Liver
B. Kidney
C. Pancreas
D. Thyroid

Answer
B. Kidney

Rationale
Urea and creatinine are commonly used to assess kidney function. Increased levels may suggest reduced renal clearance, dehydration, renal impairment, or other kidney-related issues.

Bench Clue
A patient has increased urea and increased creatinine.

Trap Answer
A. Liver function is more commonly assessed using ALT, AST, ALP, GGT, bilirubin, albumin, and coagulation-related markers.
C. Pancreatic assessment involves amylase and lipase.
D. Thyroid assessment usually involves TSH and free T4.

Exam Pearl
Urea + creatinine = kidney function duo.

Question 4

Which test is most commonly used to assess long-term glycemic control?
A. Fasting glucose
B. Random glucose
C. HbA1c
D. Urine ketones

Answer
C. HbA1c

Rationale
HbA1c reflects average blood glucose over approximately the previous 2–3 months because it measures glycation of hemoglobin over the red blood cell lifespan.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
A. Fasting glucose reflects glucose status at one point in time.
B. Random glucose is useful clinically but does not reflect long-term control.
D. Urine ketones help assess ketosis, not long-term glycemic control.

Exam Pearl
Glucose is a snapshot. HbA1c is the movie.

Question 5

Which enzyme is most associated with cholestasis or biliary obstruction?

A. ALT
B. AST
C. ALP
D. CK

Answer
C. ALP

Rationale
Alkaline phosphatase is increased in cholestasis and biliary obstruction. It may also be increased in bone disease, so correlation with GGT can help identify a hepatic source.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
A. ALT is more associated with hepatocellular injury.
B. AST is less liver-specific and may increase with liver, muscle, or cardiac injury.
D. CK is mainly associated with muscle injury.

Exam Pearl
ALP + GGT up together = think biliary/liver source.

Question 6

Which cardiac marker rises early after myocardial injury and is relatively cardiac-specific?

A. Troponin
B. Amylase
C. ALP
D. GGT

Answer
A. Troponin

Rationale
Cardiac troponins are highly useful markers of myocardial injury and are relatively cardiac-specific compared with older markers.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
B. Amylase is associated with pancreatic and salivary sources.
C. ALP is associated with cholestasis and bone.
D. GGT is associated with hepatobiliary disease and alcohol-related enzyme induction.

Exam Pearl
For myocardial injury, troponin is the main character.

Question 7

A patient with diabetic ketoacidosis would most likely have which acid-base pattern?
A. Metabolic alkalosis
B. Respiratory alkalosis
C. Metabolic acidosis
D. Respiratory acidosis

Answer
C. Metabolic acidosis

Rationale
Diabetic ketoacidosis causes accumulation of ketoacids, producing high anion gap metabolic acidosis.

Bench Clue
A patient with diabetic ketoacidosis would most likely have which acid-base pattern?

Trap Answer
A. Metabolic alkalosis is more commonly associated with vomiting, diuretics, or volume contraction.
B. Respiratory alkalosis is usually due to hyperventilation as the primary disorder.
D. Respiratory acidosis is due to CO_2 retention, such as hypoventilation.

Exam Pearl
DKA = ketones + low bicarbonate + high anion gap metabolic acidosis.

Question 8

Which analyte is most affected by prolonged tourniquet application and hemoconcentration?
A. Total protein
B. Chloride
C. Urea
D. Creatinine

Answer
A. Total protein

Rationale
Prolonged tourniquet use causes hemoconcentration, increasing large molecules and protein-bound substances. Total protein and albumin are commonly affected.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
B. Chloride is not as strongly affected by hemoconcentration.
C. Urea may vary clinically but is not the classic tourniquet-related analyte.
D. Creatinine is not as strongly affected as proteins by hemoconcentration.

Exam Pearl
Tourniquet too long = hemoconcentration = proteins and protein-bound analytes can look falsely high.

Question 9

Which lipid result is commonly calculated rather than directly measured in routine lipid profiles?
A. Total cholesterol
B. HDL cholesterol
C. Triglycerides
D. LDL cholesterol

Answer
D. LDL cholesterol

Rationale
LDL cholesterol is often calculated using a formula when triglycerides are within an acceptable range. Direct LDL methods may be used when triglycerides are high or calculation is unreliable.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
A. Total cholesterol is directly measured.
B. HDL cholesterol is typically measured after separation or direct assay methods.
C. Triglycerides are directly measured enzymatically.

Exam Pearl
Calculated LDL can get sketchy when triglycerides are high.

Question 10

Which protein is the major contributor to plasma oncotic pressure?
A. Albumin
B. Fibrinogen
C. Immunoglobulin G
D. C-reactive protein

Answer
A. Albumin

Rationale
Albumin is the most abundant plasma protein and contributes significantly to oncotic pressure, helping retain fluid within the vascular space.

Bench Clue
Focus on the key specimen, result pattern, or timing detail in the stem.

Trap Answer
B. Fibrinogen is important for coagulation, not the main oncotic pressure contributor.
C. Immunoglobulins contribute to total protein but are not the main oncotic pressure protein.
D. CRP is an acute-phase reactant and is present in much lower concentration.

Exam Pearl
Low albumin = edema risk because fluid escapes the vascular space more easily.