

**AMERICAN MEDICAL TECHNOLOGISTS LABORATORY PRACTITIONER
 CERTIFICATION EXAMINATION COMPETENCIES**

Content Area, Sub-area, and Competency

I. GENERAL LABORATORY

A. Laboratory quality

1. Perform quality control necessary in the clinical laboratory and know related terminology:

linearity	delta o.d.	coefficient of variation
accuracy	skewness	confidence limit
precision	mean value	normal distribution
reliability	standard deviation	shift, trend

2. Perform proficiency testing
3. Employ quality improvement (TQM, CQI, PIC)

B. Laboratory laws and regulations

1. Observe OSHA regulations
2. Observe CLIA regulations
3. Observe HIPAA regulations

C. Laboratory safety

1. Employ universal (standard) precautions
2. Employ equipment safety
3. Employ materials safety
4. Employ hazardous chemical safety

D. Laboratory instrumentation, maintenance, and principles of operation

1. Use manual instrumentation
 - a. Use glassware and pipettes
 - b. Clean and maintain instruments
 - c. Calibrate instruments
2. Use automated instrumentation and analyzers

E. Laboratory mathematics

1. Prepare normal solutions, molar solutions, percentage solutions (w/w, w/v, and v/v), and calculate equivalent weight
2. Know designations and abbreviations used for weights and measures

F. General microscopy

1. Know types of microscopes
2. Know parts of binocular microscope
3. Use binocular microscope
4. Calibrate ocular micrometer

G. Phlebotomy and Specimen Collection

1. Collect and handle blood specimens for analysis
2. Know the differences between serum, plasma, and whole blood
3. Employ precautions when collecting blood samples
4. Employ procedures to prevent hemolysis

5. Collect blood in collecting tubes for analysis (clotted blood and anticoagulated blood)
6. Employ proper order of draw when collecting blood in multiple types of vacuum tubes
7. Employ proper anticoagulants for each analysis
8. Know effects of improper anticoagulant use
9. Handle and preserve body fluids for chemical analysis
10. Preserve urine specimens
11. Know procedure for blood culture collection
12. Know the proper labeling of blood tubes

H. Toxicology

I. Electrophoresis

1. Know the principles of protein electrophoresis
2. Know the principles of immunoelectrophoresis
3. Know the principles of isoenzyme electrophoresis (LDH,CK, alkaline phosphatase)
4. Know the principles of hemoglobin electrophoresis

II. CHEMISTRY

A. General Knowledge

1. Know terminology related to clinical chemistry:

filtrate	enzymes
supernatant	isoenzymes
precipitate	electrolytes
decant	chromatography
wavelength	radioimmunoassay (RIA)
end point chemistry	radial immunodiffusion (RID)
kinetic chemistry	enzyme linked immunoassay (ELISA)
rate analysis	fluorescence polarization immunoassay(FPIA)
chemilluminescence	
2. Understand Beer's (Beer-Lambert) Law

B. Instrumentation: cleaning, maintenance, and principles of operation

1. Use spectrophotometer
 - a. Know parts and principles
 - b. Know the difference between colorimeter and spectrophotometer
 - c. Know how light waves are measured
2. Calibrate spectrophotometer
3. Know terminology related to light and wavelengths
4. Know principles of, and tests performed by fluorescence spectrophotometry
5. Employ automated instrumentation
 - a. Know discrete analysis and the instruments utilizing this procedure
 - b. Use random access analyzer
6. Perform daily, weekly, and monthly maintenance on chemical analyzers
7. Know the operation and principles of special analyzers
 - a. osmometer
 - b. nephelometer
 - c. radioimmunoassay (RIA)
 - d. enzyme immunoassay (EIA)
 - e. ultraviolet spectrophotometer
 - f. enzyme linked immunoassay (ELISA)

- g. fluorescence polarization immunoassay (FPIA)
 - h. ion selective electrode systems
 - i. sandwich technique
8. Know use and maintenance of other laboratory instruments
 - a. balance
 - b. automatic pipette
 - c. blood gas apparatus
 - d. meters (pH meter and refractometer)

C. Kidney and Renal Function Tests

1. Perform kidney function tests and know normal values
2. Perform kidney clearance tests and know normal values

D. Liver and Hepatic Function Tests

1. Know the anatomy of the liver
2. Know the formation of bilirubin and urobilinogen
3. Perform liver function tests
 - a. Know which tests are elevated in liver disease
 - b. Know which tests are elevated in obstructive jaundice
 - c. Know which tests are elevated in hemolytic jaundice

E. Carbohydrate Metabolism Tests

1. Know terminology related to carbohydrates and carbohydrate metabolism

ketones	insulin	monosaccharide
glycogen	glycolysis	polysaccharide
carbohydrate	lipogenesis	glycogenolysis
disaccharide	glycogenesis	renal threshold
2. Know the body's uses of carbohydrates
3. Perform tests for glucose analysis
 - a. Perform tests for all carbohydrates and reducing substances
 - b. Perform true glucose tests (glucose-specific)
 - c. Perform tests for glucose (blood, urine, and spinal fluid)
4. Perform glucose tolerance test
 - a. Perform oral glucose tolerance test
 - b. Perform intravenous glucose tolerance test
 - c. Recognize a normal glucose tolerance curve
 - d. Recognize a diabetic glucose tolerance curve
 - e. Recognize a hypoglycemic (flat) curve
5. Know the principles of glycohemoglobin A_{1c} procedure

F. Protein Analysis

1. Know proteins and functions
2. Know what comprises a total protein
3. Know the A/G ratio
4. Know body constituents composed of protein (hemoglobin, fibrinogen, enzymes, etc.)
5. Know principles, methods, and normal values of total protein analyses
6. Know principles, methods, and normal values of albumin analyses
7. Know principles, methods, and normal values of globulin analyses
8. Know principles and procedures of protein electrophoresis