

***Clinical Laboratory Chemistry, 2e (Sunheimer)***  
**Chapter 1 Laboratory Basics**

1) Ion-exchange filters remove which of the following from a water source?

- A) Ions to reduce the mineral content of water
- B) Lead
- C) Organic solvents.
- D) Bacteria

Answer: A

2) Activated carbon filters remove:

- A) Ions from water.
- B) Organic compounds from water.
- C) Acids and bases from water.
- D) Large particulates from water.

Answer: B

3) A 0.22-micron filter will remove:

- A) Particles with a diameter of 0.01 microns.
- B) Particles with a diameter of 0.01 nanometers.
- C) Particles with a diameter of 2.2 microns.
- D) Only sodium chloride crystals.

Answer: C

4) The unit of resistivity is:

- A) Amperes.
- B) Volts.
- C) Coulombs.
- D)  $M\Omega \cdot \text{cm}$ .

Answer: D

5) Microbiological impurities in source water are reported in which format?

- A) Colony forming units per mL (Cfu/mL)
- B) Total organic carbon (TOC) in ng/g
- C) milligrams of  $\text{SiO}_2$
- D) Resistivity.

Answer: A

6) According to CLSI, the resistivity of clinical laboratory reagent water (CLRW) must be:

- A)  $> 100$  milliamps.
- B)  $< 10$  millivolts.
- C)  $> 10 M\Omega \cdot \text{cm}$ .
- D)  $< 10 M\Omega \cdot \text{cm}$ .

Answer: C

7) Which of the following should not be stored in borosilicate glass because it will etch the inside surface of the glass container?

- A) Saline
- B) Strong bases (caustics)
- C) Clinical laboratory reagent water
- D) Weak acids

Answer: B

8) Low actinic glassware has which of the following properties?

- A) High thermal resistance with no color added to the glass
- B) Low thermal resistance with a green-yellow color added as an integral part of the glass
- C) High thermal resistance with a blue color added as an integral part of the glass
- D) High thermal resistance with an amber or red color added as an integral part of the glass

Answer: D

9) Care must be taken before selecting polyethylene plastic for use as test tubes and disposable transfer pipets because:

- A) Polyethylene can bind or absorb proteins, dyes, stains, and picric acid.
- B) Polyethylene does not bind or absorb proteins, dyes, stains, and picric acid.
- C) Polyethylene cannot be used to pipet serum.
- D) Polyethylene forms insoluble salts in the presence of sodium chloride.

Answer: A

10) Which of the following classes of glassware, including pipets, is manufactured and calibrated to deliver the most accurate volume of liquid?

- A) A
- B) B
- C) AA
- D) C

Answer: A

11) A *to deliver* or *TD pipet* is designed to:

- A) Allow the user to remove a portion of the sample in the tip for better accuracy.
- B) Be vigorously tapped against the test tube after all the liquid is removed.
- C) Drain by gravity.
- D) Be refilled or rinsed out with the appropriate solvent after the initial liquid has been drained from the pipet.

Answer: C

12) Which of the following devices is used to calibrate laboratory thermometers?

- A) Barometer
- B) Gallium melting point cell
- C) Titanium freezing point cell
- D) Platinum cathode voltmeter

Answer: B

13) Convert 75 mg/dL to mg/L.

- A) 7.5 mg/L
- B) 75.0 mg/L
- C) 750 mg/L
- D) 7500 mg/L

Answer: C

14) Convert 70.0 mg/dL glucose to mmol/L glucose.

- A) 3.89 mmol/L
- B) 38.9 mmol/L
- C) 70.0 mmol/L
- D) 389 mmol/L

Answer: A

15) If a thermometer reads 39°F, what is the equivalent degree Celsius (°C)?

- A) 0.39°C
- B) 3.9°C
- C) 39°C
- D) 40°C

Answer: B

16) Convert 200 picograms to grams.

- A)  $2.0 \times 10^{-10}$  grams
- B)  $2.0 \times 10^{-8}$  grams
- C) 20.0 grams
- D) 200 grams

Answer: A

17) A patient's calcium result is 8.0 mg/dL. Convert this result to mmol/L.

- A) 0.004 mmol/L
- B) 0.20 mmol/L
- C) 2.0 mmol/L
- D) 20.0 mmol/L

Answer: C

18) The surface area of a laboratory bench measures 12 square feet. What is the surface area in square meters?

- A) 1.115 square meters
- B) 11.15 square meters
- C) 111.5 square meters
- D) 1115 square meters

Answer: A

19) What is the weight in kilograms for a 24-hours stool specimen that weighs 0.50 pounds ?

- A) 0.0226 kilograms
- B) 0.2265 kilograms
- C) 2.265 kilograms
- D) 22.65 kilograms

Answer: B

20) How much serum is required to make a 1 to 4 dilution with a total volume of 100.0  $\mu\text{L}$  ?

- A) 0.025  $\mu\text{L}$
- B) 0.25  $\mu\text{L}$
- C) 2.5  $\mu\text{L}$
- D) 25  $\mu\text{L}$

Answer: D

21) A patient's creatinine is outside the linear range of the analyzer; 10  $\mu\text{L}$  of serum is added to 90.0  $\mu\text{L}$  of diluent and the diluted sample is reanalyzed. The creatinine value of the diluted sample is 1.0 mg/dL. Which of the following creatinine values is correct?

- A) 1.0 mg/dL
- B) 10.0 mg/dL
- C) 20.0 mg/dL
- D) 100 mg/dL

Answer: B

22) What is the dilution factor if 10 mL of sample is added to 190 mL of diluent?

- A) 10
- B) 19
- C) 20
- D) 25

Answer: C

23) A serum creatine kinase is diluted 1/200 with a result of 50 U/L. What is the patients' actual creatine kinase result?

- A) 50 U/L
- B) 200 U/L
- C) 1000 U/L
- D) 10,000 U/L

Answer: D

24) How many grams of sodium hydroxide (NaOH) are required to prepare 250 mL of a 1.00 molar (M) solution?

- A) 2.5 g
- B) 10.0 g
- C) 25.0 g
- D) 100 g

Answer: B

25) What is the normality (N) of a 1.5 molar (M)  $\text{H}_2\text{SO}_4$  solution?

- A) 1.0 N
- B) 1.5 N
- C) 3.0 N
- D) 36 N

Answer: C

26) What is the molality (M) of a solution that contains 330 g of  $\text{CaCl}_2$  per kilogram?

- A) 3.0 M
- B) 3.3 M
- C) 33.0 M
- D) Unable to determine

Answer: A

27) What is the concentration in mg/dL of a 140 mEq/L sodium standard?

- A) 0.323 mg/dL
- B) 3.23 mg/dL
- C) 32.3 mg/dL
- D) 322 mg/dL

Answer: D

28) Convert 145 mEq/L sodium concentration to mmol  $\text{Na}^+$ /L.

- A) 14.5 mmol  $\text{Na}^+$ /L
- B) 145 mmol  $\text{Na}^+$ /L
- C) 167 mmol  $\text{Na}^+$ /L
- D) 333 mmol  $\text{Na}^+$ /L

Answer: B

29) What is the molarity of a 20.0% w/v glucose solution?

- A) 0.111 molar
- B) 1.11 molar
- C) 2.22 molar
- D) 11.1 molar

Answer: B

30) Determine the molarity (M) of a solution if 125 mL of a 3.5 molar (M) solution is diluted to a final volume of 500 mL.

- A) 0.875 M
- B) 3.50 M
- C) 8.75 M
- D) 10.0 M

Answer: A

31) Convert  $40^{\circ}\text{C}$  to  $^{\circ}\text{F}$ .

- A)  $60^{\circ}\text{F}$
- B)  $90^{\circ}\text{F}$
- C)  $100^{\circ}\text{F}$
- D)  $104^{\circ}\text{F}$

Answer: D

32) What is the concentration (g/dL) of a 1/10 dilution of a 12% NaCl solution?

- A) 0.12
- B) 1.20
- C) 12.0
- D) 120.0

Answer: B

33) A solution contains 45g/100 mL of glucose. It is diluted 1/10 and diluted a second time 1/10. What is the concentration in g/100 mL of the final solution?

- A) 45.0 g/100mL
- B) 4.50 g/100 mL
- C) 0.45 g/100mL
- D) 0.045 g/100mL

Answer: B

34) How many milliliters (mL) of a 2.0M solution are required to prepare 50 mL of a 0.3M solution?

- A) 0.075 ml
- B) 0.75 ml
- C) 7.5 ml
- D) 75.0 ml

Answer: C

35) A barium chloride solution is prepared by transferring 20 g of barium chloride to 1.0 liters of water. Calculate the chloride concentration in milliequivalents per liter of this solution.

- A) 1.92 mEq Cl/L
- B) 19.2 mEq Cl/L
- C) 192.0 mEq Cl/L
- D) 384 mEq Cl/L

Answer: C