CHAPTER 1—BASIC MATHEMATICS

MULTIPLE CHOICE

1. 1/7 + 5/9 =
    a. 6/16
    b. 35/63
    c. 44/63
    d. 9/35

    ANS: C   PTS: 1   DIF: Easy

2. 5/8 × 7/9 =
    a. 12/17
    b. 45/56
    c. 12/72
    d. 35/72

    ANS: D   PTS: 1   DIF: Easy

3. 1/6 ÷ 4/5 =
    a. 1/5
    b. 4/11
    c. 5/24
    d. 4/30

    ANS: C   PTS: 1   DIF: Easy

4. 46.3 + 29.87 =
    a. 245
    b. 2,450
    c. 76.17
    d. 7.617

    ANS: C   PTS: 1   DIF: Easy

5. 16.3 × 1.2 =
    a. 19.56
    b. 195.6
    c. 17.5
    d. 1.75

    ANS: A   PTS: 1   DIF: Easy

6. 1,800 ÷ 0.30 =
    a. 0.0001
    b. 540
    c. 6,000
    d. 60,000

    ANS: C   PTS: 1   DIF: Easy

7. Convert 7/12 to a decimal.
    a. 0.583
    b. 1.714
    c. 19.83
    d. 84.00

    ANS: A   PTS: 1   DIF: Medium

8. Convert 87.3% to a decimal.
    a. 0.0873
    b. 0.873
    c. 8.73
    d. 87.3

    ANS: B   PTS: 1   DIF: Medium

9. Change 23.46 to a percent.
   a. 0.2346 %
   b. 23.46 %
   c. 2,346 %
   d. 2,346 %

   ANS: D   PTS: 1   DIF: Medium

10. The number of significant digits in 3.75×10^4 is
    a. two.
    b. three.
    c. four.
    d. five.

    ANS: B   PTS: 1   DIF: Medium

11. The inverse of 0.137 is approximately
    a. 1.37.
    b. 7.30.
    c. 73.
    d. 137.

    ANS: B   PTS: 1   DIF: Medium

12. Convert 540.7 to scientific notation.
    a. 5.407×10^2
    b. 5.407×10^{-2}
    c. 5.407×10^3
    d. 5.407×10^{-3}

    ANS: B   PTS: 1   DIF: Medium

13. $2.63 \times 10^{-2} =$
    a. 0.00263
    b. 0.0263
    c. 26.3
    d. 263

    ANS: B   PTS: 1   DIF: Medium

14. If you purchase four (4) twelve-packs of soda as a fundraiser for $10.00 and sell each can of soda for 50 cents, your profit is
    a. $9.74.
    b. $14.00.
    c. $24.00.
    d. $34.00.

    ANS: B   PTS: 1   DIF: Medium

15. Mercury (Hg), a metal, is liquid at room temperature. Its density is 13.6 g/cm³. If you have 100 mL of Hg, how many grams do you have?
    a. 0.136
    b. 1.36×10^{-3}
    c. 136
    d. 1.36×10^3

    ANS: D   PTS: 1   DIF: Difficult

16. Convert 113°F to °C.
    a. 20.3°C
    b. 62.8°C
    c. 81°C
    d. 235°C

    ANS: B   PTS: 1   DIF: Medium

17. The equation $(x+y)^2$ can be expressed as:
  a. $x^2 + 2xy + y^2$
  b. $2x + 2y$
  c. $x + 2xy + y^2$
  d. $x^2 + y^2 + xy$

  ANS: A   PTS: 1   DIF: Medium

18. Consider the following proportional relationship: $x = ay/bd$. Assuming all other quantities remain constant, what happens to the value of x when b increases?
  a. increases
  b. decreases
  c. remains the same
  d. cannot be determined

  ANS: B   PTS: 1   DIF: Medium

19. Consider the following proportional relationship: $x = ay/bd$. Assuming all other quantities remain constant, what happens to the value of x when d decreases?
  a. increases
  b. decreases
  c. remains the same
  d. cannot be determined

  ANS: A   PTS: 1   DIF: Medium

20. Consider the following proportional relationship: $x = ay/bd$. Assuming all other quantities remain constant, what happens to the value of x when the product of bd increases?
  a. increases
  b. decreases
  c. remains the same
  d. cannot be determined

  ANS: B   PTS: 1   DIF: Medium

COMPLETION

1. 74 kV is equal to _____ volts.

  ANS: 74,000

  PTS: 1   DIF: Easy

2. 400 mA is equal to _____ amperes.

  ANS: 0.40

  PTS: 1   DIF: Easy

3. 120,000 V is equal to _____ kVp.

  ANS: 120

  PTS: 1   DIF: Easy

4. 3.7 m are equal to _____ cm.

   ANS: 370

   PTS: 1   DIF: Easy

PROBLEM

1. $1/R = 1/R_1 + 1/R_2$; solve for R_2.

   ANS:
   $RR_1/ R_1 - R$

   PTS: 1   DIF: Difficult

2. $F = Gm_1m_2/r^2$; solve for m_1.

   ANS:
   Fr^2/Gm_2

   PTS: 1   DIF: Difficult

3. $PV = nRT$; solve for T.

   ANS:
   PV/nR

   PTS: 1   DIF: Difficult

4. $I = E/R + r$; solve for r.

   ANS:
   $E - IR/I$

   PTS: 1   DIF: Difficult

5. $P = 2L + 2W$; solve for L.

   ANS:
   $(P - 2W)/2$

   PTS: 1   DIF: Difficult

6. $V = 1/3\pi r^2h$; solve for π.

   ANS:
   $3V/r^2h$

   PTS: 1   DIF: Difficult

7. $P_1V_1/T_1 = P_2V_2/T_2$; solve for V_2.

ANS:
$P_2V_2T_1/P_1V_1$

PTS: 1   DIF: Difficult