Chapter 1 Concepts of Motion

1.1 Conceptual Questions

1) The current definition of the standard meter of length is based on
   A) the distance between the earth's equator and north pole.
   B) the distance between the earth and the sun.
   C) the distance traveled by light in a vacuum.
   D) the length of a particular object kept in France.

Answer: C
Var: 1

2) The current definition of the standard second of time is based on
   A) the frequency of radiation emitted by cesium atoms.
   B) the earth's rotation rate.
   C) the duration of one year.
   D) the oscillation of a particular pendulum kept in France.

Answer: A
Var: 1

3) The current definition of the standard kilogram of mass is based on
   A) the mass of the earth.
   B) the mass of the sun.
   C) the mass a particular object kept in France.
   D) the mass of a cesium-133 atom.

Answer: C
Var: 1

4) If a woman weighs 125 lb, her mass expressed in kilograms is x kg, where x is
   A) less than 125.
   B) greater than 125.

Answer: A
Var: 1

5) If a tree is 15 m tall, its height expressed in feet is x ft, where x is
   A) less than 15.
   B) greater than 15.

Answer: B
Var: 1

6) If a flower is 6.5 cm wide, its width expressed in millimeters is x mm, where x is
   A) less than 6.5.
   B) greater than 6.5.

Answer: B
Var: 1

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7) If an operatic aria lasts for 5.75 min, its length expressed in seconds is x s, where x is
A) less than 5.75.
B) greater than 5.75.

Answer: B
Var: 1

8) Scientists use the metric system chiefly because it is more accurate than the English system.
A) True
B) False

Answer: B
Var: 1

9) When adding two numbers, the number of significant figures in the sum is equal to the number of significant figures in the least accurate of the numbers being added.
A) True
B) False

Answer: B
Var: 1

10) When determining the number of significant figures in a number, zeroes to the left of the decimal point are never counted.
A) True
B) False

Answer: B
Var: 1

1.2 Problems

1) Convert 1.2×10^{-3} to decimal notation.
A) 1.200
B) 0.1200
C) 0.0120
D) 0.0012
E) 0.00012

Answer: D
Var: 5

2) Write out the number 7.35×10^{-5} in full with a decimal point and correct number of zeros.
A) 0.00000735
B) 0.0000735
C) 0.000735
D) 0.00735
E) 0.0735

Answer: B
Var: 5

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3) 0.0001776 can also be expressed as
   A) 1.776×10^{-3}.
   B) 1.776×10^{-4}.
   C) 17.72×10^{4}.
   D) 1772×10^{5}.
   E) 177.2×10^{7}.

   Answer: B
   Var: 5

4) 0.00325×10^{-8} cm can also be expressed in mm as
   A) 3.25×10^{-12} mm.
   B) 3.25×10^{-11} mm.
   C) 3.25×10^{-10} mm.
   D) 3.25×10^{-9} mm.
   E) 3.25×10^{-8} mm.

   Answer: C
   Var: 1

5) If, in a parallel universe, π has the value 3.14149, express π in that universe to four significant figures.
   A) 3.141
   B) 3.142
   C) 3.1415
   D) 3.1414

   Answer: A
   Var: 1

6) The number 0.003010 has
   A) 7 significant figures.
   B) 6 significant figures.
   C) 4 significant figures.
   D) 2 significant figures.

   Answer: C
   Var: 1

7) What is $\frac{0.674}{0.74}$ to the proper number of significant figures?
   A) 0.91
   B) 0.911
   C) 0.9108
   D) 0.9

   Answer: A
   Var: 50+

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8) What is the value of $\pi(8.104)^2$, written with the correct number of significant figures?
A) 206.324
B) 206.323
C) 206.3
D) 206
E) 200

Answer: C
Var: 1

9) What is the sum of 1123 and 10.3 written with the correct number of significant figures?
A) 1.13×10^3
B) 1133.3000
C) 1.1×10^3
D) 1133.3
E) 1133

Answer: E
Var: 1

10) What is the sum of 1.53 + 2.786 + 3.3 written with the correct number of significant figures?
A) 8
B) 7.6
C) 7.62
D) 7.616
E) 7.6160

Answer: B
Var: 3

11) What is the difference between 103.5 and 102.24 written with the correct number of significant figures?
A) 1
B) 1.3
C) 1.26
D) 1.260
E) 1.2600

Answer: B
Var: 3

12) What is the product of 11.24 and 1.95 written with the correct number of significant figures?
A) 22
B) 21.9
C) 21.92
D) 21.918
E) 21.9180

Answer: B
Var: 3

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13) What is the result of 1.58 ÷ 3.793 written with the correct number of significant figures?

A) 4.1656×10^{-1}

B) 4.166×10^{-1}

C) 4.17×10^{-1}

D) 4.2×10^{-1}

E) 4×10^{-1}

Answer: C

Var: 3

14) What is 34 + (3) × (1.2465) written with the correct number of significant figures?

A) 37.7

B) 37.74

C) 4×10^{1}

D) 38

E) 37.7395

Answer: D

Var: 5

15) What is 56 + (32.00)/(1.2465 + 3.45) written with the correct number of significant figures?

A) 62.8

B) 62.812

C) 62.81

D) 63

E) 62.8123846

Answer: D

Var: 1

16) Add 3685 g and 66.8 kg and express your answer in milligrams (mg).

A) 7.05×10^{7} mg

B) 7.05×10^{4} mg

C) 7.05×10^{5} mg

D) 7.05×10^{6} mg

Answer: A

Var: 50+

17) Express $(4.3 \times 10^{6})^{-1/2}$ in scientific notation.

A) 4.8×10^{-4}

B) 2.1×10^{3}

C) 2.1×10^{-5}

D) 2.1×10^{4}

Answer: A

Var: 40

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