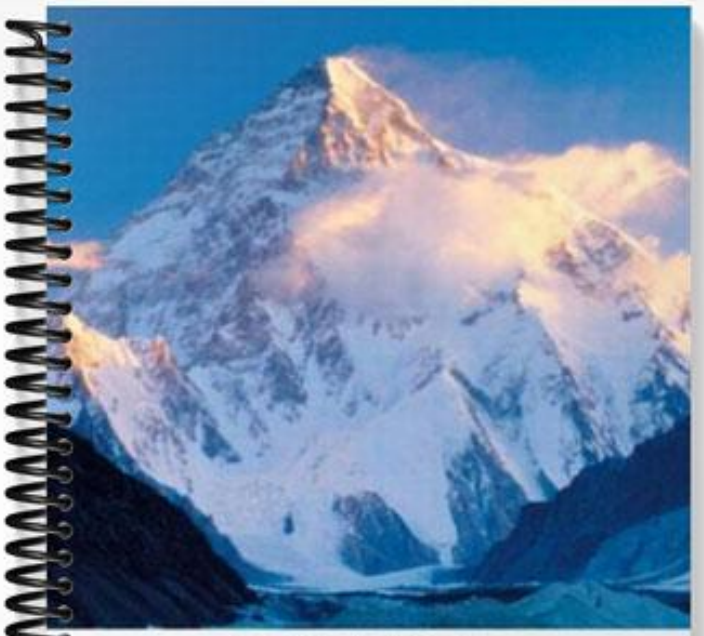
TEST BANK



Sixth Edition

PHYSICS

GIANCOLI

Contents

Test Item File
to accompany

Physics: Principles with Applications
Sixth Edition
Douglas Giancoli

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Preface

This test bank is a revision and update of the ***Test Item File*** accompanying the fifth edition of Douglas Giancoli's ***Physics: Principles with Applications***. The sixth edition test bank was created with TestGenerator, a networkable program for creating quizzes and exams. TestGenerator allows users to modify existing questions/problems, including algorithmic versions, as well as create and input new questions/problems.

This test bank contains approximately 2500 multiple choice, short answer, and essay questions. The majority of the multiple choice questions and problems could also be given as free response questions or problems. Like the end of chapter of ***Physics: Principles with Applications***, each chapter of the test bank is divided into two sections: **Conceptual Questions** and **Quantitative Problems**. Thus, nearly 50% of the material in the test bank is conceptual in nature. All questions and problems are ranked by level of difficulty and are referenced to the corresponding section in the textbook. The notation in the sixth edition test bank has been updated to reflect the notation used in the sixth edition of ***Physics: Principles with Applications***.

About the Author

Dr. Delena Bell Gatch has taught introductory physics at Georgia Southern University since early 2001. She completed her Ph.D. at the University of Georgia in September of 2000, and remained at the University of Georgia as a post doctorial assistant before accepting the assistant professor position Georgia Southern University. Her field of specialty is experimental condensed matter physics. Her research ventures have included the study of the properties of powder phosphors for flat panel displays, the development of new infrared detection schemes utilizing visible emission from crystals, and the investigation of the shifts in energy levels of crystals due to the application of hydrostatic pressure.

During a typical semester, Dr. Gatch teaches three or four introductory physics classes, in addition to one-to-three introductory physics labs. She works with students in the University Honors Program who desire to study physics in greater depth. She also spends time outside of the classroom assisting her premedical students who are preparing to take the MCAT.

Chapter 1 Introduction, Measurement, Estimating

Conceptual Questions

1) Four students measure the mass of an object, each using a different scale. They record their results as follows:

Student	A	B	C	D
Mass (g)	49.06	49	50	49.2

Which student used the least precise scale?

A) A

B) B

C) C

D) D

Answer: C
Diff: 1 *Page Ref: Sec. 1.4*

2) Four students measure the mass of an object, each using a different scale. They record their results as follows:

Student	A	B	C	D
Mass (g)	49.06	49	50	49.2

Which student used the most precise scale?

A) A

B) B

C) C

D) D

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

3) A useful method of expressing very small or very large numbers is

A) scientific notation.

B) arabic numerals.

C) the metric system.

D) roman numerals.

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

4) All of the following are base units of the SI system except:
   A) kilogram.
   B) kelvin.
   C) meter.
   D) volt.

   Answer: D
   Diff: 1 *Page Ref: Sec. 15–1.6*

5) Select the list which contains only SI basic units.
   A) liter, meter, second, watt
   B) joule, kelvin, kilogram, watt
   C) candela, kelvin, meter, second
   D) joule, newton, second, watt

   Answer: C
   Diff: 1 *Page Ref: Sec. 1.5–1.6*

6) How many basic units does the SI system have?
   A) four
   B) five
   C) seven
   D) ten

   Answer: C
   Diff: 1 *Page Ref: Sec. 1.5–1.6*

7) The base SI unit of time is
   A) hour.
   B) minute.
   C) second.
   D) millisecond.

   Answer: C
   Diff: 1 *Page Ref: Sec. 1.5–1.6*

8) In the CGS system, what are the fundamental units?
   A) Newton, centimeter, second
   B) kilogram, meter, second
   C) gram, centimeter, minute
   D) gram, centimeter, second

   Answer: D
   Diff: 2 *Page Ref: Sec. 1.5–1.6*

9) The metric prefix for one one–thousandth is

A) milli.

B) centi.

C) kilo.

D) mega.

Answer: A
Diff: 1 *Page Ref: Sec. 1.5–1.6*

10) The metric prefix for one one–hundredth is

A) milli.

B) centi.

C) kilo.

D) mega.

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

11) The metric prefix for one thousand is

A) milli.

B) centi.

C) kilo.

D) mega.

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

12) Express the number 0.02 days using a prefix of Table 1–4.

A) 2 decidays

B) 2 centidays

C) 2 millidays

D) 2 microdays

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

13) What is the conversion factor between km/h and m/s?

A) 0.0278 m/s

B) 0.278 m/s

C) 3.60 m/s

D) 16.7 m/s

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

14) What is the conversion factor between km/h^2 and m/s^2?

A) $7.72 \times 10^{-6}\ \text{m/s}^2$

B) $2.78 \times 10^{-1}\ \text{m/s}^2$

C) $1.30 \times 10^{4}\ \text{m/s}^2$

D) $3.60\ \text{m/s}^2$

Answer: A
Diff: 1 *Page Ref: Sec. 1.5–1.6*

15) What is the conversion factor between cm^2 and m^2?

A) $0.01\ \text{m}^2/\text{cm}^2$

B) $0.0001\ \text{m}^2/\text{cm}^2$

C) $100\ \text{m}^2/\text{cm}^2$

D) $10000\ \text{m}^2/\text{cm}^2$

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

16) The position, x, of an object is given by the equation $x = A + Bt + Ct^2$, where t refers to time. What are the dimensions of A, B, and C?

A) distance, distance, distance

B) distance, time, time^2

C) distance, distance/time, distance/time^2

D) distance/time, distance/time^2, distance/time^3

Answer: C
Diff: 2 *Page Ref: Sec. 1.8*

Quantitative Problems

1) What is the percent uncertainty in the measurement 2.58 ± 0.15 cm?

A) 2.9%

B) 5.8%

C) 8.7%

D) 12%

Answer: B
Diff: 2 *Page Ref: Sec. 1.4*

2) What, approximately, is the percent uncertainty for the measurement 5.2?

A) 1%

B) 2%

C) 3%

D) 4%

Answer: B
Diff: 2 *Page Ref: Sec. 1.4*

3) What is the percent uncertainty in the area of a circle whose radius is 1.8×10^4 cm?

A) 1.1%

B) 5.6%

C) 11%

D) 56%

Answer: C
Diff: 3 *Page Ref: Sec. 1.4*

4) What is the volume, and its approximate uncertainty, of a sphere of radius 1.96 ± 0.01 m?

A) 31.5 ± 0.2 m^2

B) 31.5 ± 0.3 m^2

C) 31.5 ± 0.4 m^2

D) 31.5 ± 0.5 m^2

Answer: D
Diff: 3 *Page Ref: Sec. 1.4*

5) The number of significant figures in 10001 is

A) two.

B) three.

C) five.

D) six.

Answer: C
Diff: 1 *Page Ref: Sec. 1.4*

6) The number of significant figures in 0.01500 is

A) two.

B) three.

C) four.

D) five.

Answer: C
Diff: 1 *Page Ref: Sec. 1.4*

7) The number of significant figures in 0.040 is

A) one.

B) two.

C) three.

D) four.

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

8) Which of the following has three significant figures?

A) 305.0 cm

B) 0.0500 mm

C) 1.00081 kg

D) 8.060×10^{11} m^2

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

9) What is the sum of 2.67 + 1.976 + 2.1?

A) 6.7

B) 6.75

C) 6.746

D) 6.7460

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

10) What is the difference between 103.5 and 102.24?

A) 1.3

B) 1.26

C) 1.260

D) 1.2600

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

11) What is the product of 12.56 and 2.12?

A) 27

B) 26.6

C) 26.23

D) 26.627

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

12) What is the result of 2.43 ÷ 4.561?

A) 5.3278×10^{-1}

B) 5.328×10^{-1}

C) 5.33×10^{-1}

D) 5.3×10^{-1}

Answer: C
Diff: 1 *Page Ref: Sec. 1.4*

13) What is the cosine of 55°?

A) 0.6

B) 0.57

C) 0.574

D) 0.5736

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

14) The length and width of a rectangle are 1.125 m and 0.606 m, respectively. Multiplying, your calculator gives the product as 0.68175. Rounding properly to the correct number of significant figures, the area should be written as

A) 0.68 m^2.

B) 0.682 m^2.

C) 0.6818 m^2.

D) 0.68175 m^2.

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

15) The length and width of a rectangle are 1.125 m and 0.606 m, respectively. You calculate the rectangle's perimeter by adding these and multiplying by two. Your calculator's display reads 3.462. To the correct number of significant figures, this should be written as

A) 3.5 m.

B) 3.46 m.

C) 3.462 m.

D) 3.4620 m.

Answer: C
Diff: 1 *Page Ref: Sec. 1.4*

16) A rectangle is 3.25 m long and 1.5 m wide. What is its area?

A) 4.875 m^2

B) 4.87 m^2

C) 4.80 m^2

D) 4.9 m^2

Answer: D
Diff: 2 *Page Ref: Sec. 1.4*

17) A rectangular garden measures 15 m long and 13.7 m wide. What is the length of a diagonal from one corner of the garden to the other?

A) 18 m

B) 19 m

C) 20 m

D) 4.1×10^2 m

Answer: C
Diff: 2 *Page Ref: Sec. 1.4*

18) Select the smallest value.

A) 15×10^{-3}

B) 0.15×10^0

C) 0.00015×10^3

D) 0.00000015×10^6

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

19) Write the number 0.00045 in power of ten notation.

A) 4.5×10^{-4}

B) 4.5×10^{-3}

C) 4.5×10^{-2}

D) 4.5×10^{-1}

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

20) 0.0001776 can also be expressed as

A) 1.776×10^{-4}.

B) 17.72×10^4.

C) 1772×10^5.

D) 177.2×10^7.

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

21) 4567.89 is properly expressed in scientific notation as

A) 4.56789×10^3.

B) 45.6789×10^2.

C) 456.789×10^1.

D) 4567.89×10^0.

Answer: A
Diff: 1 *Page Ref: Sec. 1.4*

22) Convert 1.2×10^{-3} to decimal notation.

A) 1.200

B) 0.1200

C) 0.0120

D) 0.0012

Answer: D
Diff: 1 *Page Ref: Sec. 1.4*

23) Write out the number 8.42×10^{-5} in full with a decimal point and correct number of zeros.

A) 0.00000842

B) 0.0000842

C) 0.000842

D) 0.00842

Answer: B
Diff: 1 *Page Ref: Sec. 1.4*

24) What is the result of $(0.410 + 0.021) \times (2.20 \times 10^{3})$?

A) 880

B) 946

C) 948

D) 950

Answer: C
Diff: 2 *Page Ref: Sec. 1.4*

25) Write the number 13.5 gigameters as full (decimal) numbers with standard units.

A) 135,000 m

B) 135,000,000 m

C) 135,000,000,000 m

D) 13,500,000,000 m

Answer: D
Diff: 1 *Page Ref: Sec. 1.5–1.6*

26) 100 mL is equivalent to which of the following?

A) 1 kL

B) 10^{-6} μL

C) 0.1 L

D) 0.01 ML

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

27) How many grams is forty milligrams?

A) 0.000040 g

B) 0.00040 g

C) 0.040 g

D) 40000 g

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

28) How many meters is sixty kilometers?

A) 600,000 m

B) 60,000 m

C) 60 m

D) 0.06 m

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

29) 1 angstrom = 10^{-10} m and 1 fermi = 10^{-15} m, what is the relationship between these units?

A) 1 angstrom = 10^{5} fermi

B) 1 angstrom = 10^{-5} fermi

C) 1 angstrom = 10^{-25} fermi

D) 1 angstrom = 10^{+25} fermi

Answer: A
Diff: 1 *Page Ref: Sec. 1.5–1.6*

30) 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.

Answer: C
Diff: 2 *Page Ref: Sec. 1.5–1.6*

31) Which one of the following is not equivalent to 2.50 miles? (1 mi = 1.609 km = 5280 ft, 1 ft = 12 in.)

A) 1.32×10^{4} ft

B) 1.58×10^{5} in.

C) 4.02×10^{3} km

D) 4.40×10^{3} yd

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

32) If you are 5'10" tall, what is your height in meters? (1 in = 2.54 cm.)

A) 1.5 m

B) 1.6 m

C) 1.7 m

D) 1.8 m

Answer: D
Diff: 1 *Page Ref: Sec. 1.5–1.6*

33) If 1 inch = 2.54 cm, and 1 yd = 36 in., how many meters are in 7.00 yd?

A) 6.40 m

B) 36.3 m

C) 640 m

D) 1.78×10^3 m

Answer: A
Diff: 2 *Page Ref: Sec. 1.5–1.6*

34) A hot air balloon rises to an altitude of 600 fathoms. What is this height, in feet? (1 fathom = 6 ft.)

A) 100 ft

B) 600 ft

C) 1200 ft

D) 3600 ft

Answer: D
Diff: 1 *Page Ref: Sec. 1.5–1.6*

35) The average life of an animal is 70 years. Assume one numerical figure, write this in power of ten in seconds.

A) 3×10^7 s

B) 2×10^7 s

C) 2×10^9 s

D) 3×10^9 s

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

36) The mass of an electron is 9.1×10^{-31} kg. How many electrons will make a mass of 1.0 kg?

A) 9.1×10^{30}

B) 1.1×10^{30}

C) 9.1×10^{31}

D) 1.1×10^{31}

Answer: B
Diff: 1 *Page Ref: Sec. 15–1.6*

37) How many m/s is 50 mi/h equivalent to? (1 mi = 1609 m.)

A) 49 m/s

B) 2.2 m/s

C) 22 m/s

D) 45 m/s

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

38) How much longer (percentage) is a 100 m dash than a 100 yd dash? (1 yd = 0.9146 m.)

A) 3.5%

B) 6.5%

C) 8.5%

D) 12%

Answer: C
Diff: 1 *Page Ref: Sec. 1.5–1.6*

39) Which is the largest area?

A) 2,500,000 cm^2

B) 100,000 cm^2

C) 7.5 m^2

D) 0.75 m^2

Answer: B
Diff: 1 *Page Ref: Sec. 1.5–1.6*

40) If 1 inch = 2.54 cm, how many square centimeters are in 1.00 square in.?

A) 1.59

B) 2.54

C) 5.08

D) 6.45

Answer: D
Diff: 2 *Page Ref: Sec. 1.5–1.6*

41) Express the following sum with the correct number of significant figures: 1.00 kg + 1531 g + 2.54×10^4 mg.

A) 2.56 kg

B) 27.9 kg

C) 2.53 kg

D) 2.79 kg

Answer: A
Diff: 2 *Page Ref: Sec. 1.5–1.6*

42) A football field is 120 yd long and 50 yd wide. What is the area of the football field, in m^2, if 1 yd = 91.44 cm?

A) 2.4×10^3 m^2

B) 3.7×10^3 m^2

C) 4.2×10^3 m^2

D) 5.0×10^3 m^2

Answer: D
Diff: 2 *Page Ref: Sec. 1.5–1.6*

43) A ball has a radius of 3.23 cm. What is the volume of the ball in m^3?

A) 1.41×10^{-4}

B) 1.41

C) 4.23×10^{-4}

D) 4.23

Answer: A
Diff: 2 *Page Ref: Sec. 1.5–1.6*

44) A thick-walled metal pipe of length 20.0 cm has an inside diameter of 2.00 cm and an outside diameter of 2.40 cm. What is the total surface area of the pipe, counting the ends, in m^2?

A) 276

B) 277

C) 278

D) 279

Answer: D
Diff: 3 *Page Ref: Sec. 1.5–1.6*

45) The radius of the Earth is 3963 mi. What is the surface area of the Earth in square meters? (1 mi = 1609 m.)

A) 4.9×10^7 m^2

B) 1.3×10^{14} m^2

C) 2.6×10^{14} m^2

D) 5.1×10^{14} m^2

Answer: D
Diff: 2 *Page Ref: Sec. 1.5–1.6*

46) The average density of blood is 1.06×10^3 kg/m^3. If you donate a pint of blood to the Red Cross, what mass of blood have you donated, in grams? (1 pt = 1/2 L, 1 L = 1000 cm^3.)

A) 530 g

B) 0.530 g

C) 5300 g

D) 5.30×10^5 g

Answer: A
Diff: 2 *Page Ref: Sec. 1.5–1.6*

47) The mass of Mars, 6.40×10^{23} kg, is about one–tenth that of the Earth, and its radius, 3395 km, is about half that of Earth. What is the mean density of Mars in kg/m^3?

A) 9.76×10^2

B) 1.95×10^3

C) 3.90×10^3

D) 7.81×10^3

Answer: C
Diff: 2 *Page Ref: Sec. 1.5–1.6*

48) Concrete is sold by the cubic yard. What is the mass, in kilograms, of one cubic yard of concrete that is five times as dense as water? (1 m = 1.094 yd, and 1 m^3 of water has a mass of 1,000 kg.)

A) 764 kg

B) 2.42×10^3 kg

C) 3.82×10^3 kg

D) 6.55×10^3 kg

Answer: C
Diff: 2 *Page Ref: Sec. 1.5–1.6*

49) An average human has a heart rate of 70 beats per minute. If someone's heart beats at that average rate over a 70–yr lifetime, how many times would it beat?

A) 7×10^5

B) 2×10^6

C) 2×10^7

D) 3×10^9

Answer: D
Diff: 2 *Page Ref: Sec. 1.7*

50) A large school district has 300 school buses. If each school bus is used 3 hours each day, the average speed of the school buses is 15 mi/h, and the fuel economy of the buses is 10 mi/gal. How much does it cost to run these buses in 22 school days if gasoline costs $1.20 a gallon?

A) $600

B) $1200

C) $1800

D) $2400

Answer: B
Diff: 2 *Page Ref: Sec. 1.7*

51) A person stands 35.0 m from a flag pole. With a protractor at eye level, he finds that the angle at the top of the flag pole makes with the horizontal is 25.0 degrees. How high is the flag pole? (The distance from his feet to his eyes is 1.7 m.)

A) 10 m

B) 20 m

C) 30 m

D) 80 m

Answer: B
Diff: 2 *Page Ref: Sec. 1.7*

52) Starting from city A, a car drives 250 miles east to city B, then 300 miles north to city C, and finally 700 miles west to city D. What is the distance between city A and city D?

A) 300 mi

B) 400 mi

C) 500 mi

D) 600 mi

Answer: C
Diff: 2 *Page Ref: Sec. 1.7*

53) The last page of a book is numbered 764. The book is 3.00 cm thick. What is the average thickness of a sheet of paper in the book, in centimeters?

A) 4×10^{-3}

B) 8×10^{-3}

C) 100

D) 200

Answer: B
Diff: 2 *Page Ref: Sec. 1.7*

54) Wall posters are usually sold curled up in cylindrical cardboard tubes. If the length of the tube is 84.5 cm, and the diameter of the tube is 2.40 cm, what is the area of the poster, in cm^2? (Assume the poster doesn't overlap itself.)

A) 200 cm^2

B) 400 cm^2

C) 600 cm^2

D) 2000 cm^2

Answer: C
Diff: 2 *Page Ref: Sec. 1.7*

Chapter 2 Describing Motion: Kinematics in One Dimension

Conceptual Questions

1) Suppose that an object travels from one point in space to another. Make a comparison between the displacement and the distance traveled.
   A) The displacement is either greater than or equal to the distance traveled.
   B) The displacement is always equal to the distance traveled.
   C) The displacement is either less than or equal to the distance traveled.
   D) The displacement can be either greater than, smaller than, or equal to the distance traveled.

   Answer: C
   Diff: 2 *Page Ref: Sec. 2.1*

2) When is the average velocity of an object equal to the instantaneous velocity?
   A) always
   B) never
   C) only when the velocity is constant
   D) only when the velocity is increasing at a constant rate

   Answer: C
   Diff: 2 *Page Ref: Sec. 2.2–2.3*

3) A new car manufacturer advertises that their car can go "from zero to sixty in 8 s". This is a description of
   A) average speed.
   B) instantaneous speed.
   C) average acceleration.
   D) instantaneous acceleration.

   Answer: C
   Diff: 1 *Page Ref: Sec. 2.4*

4) An object moving in the +x axis experiences an acceleration of 2.0 m/s^2. This means the object is

   A) traveling at 2.0 m in every second.

   B) traveling at 2.0 m/s in every second.

   C) changing its velocity by 2.0 m/s.

   D) increasing its velocity by 2.0 m/s in every second.

   Answer: D
   Diff: 1 *Page Ref: Sec. 2.4*

5) Suppose that a car traveling to the East (+*x* direction) begins to slow down as it approaches a traffic light. Make a statement concerning its acceleration.

   A) The car is decelerating, and its acceleration is positive.

   B) The car is decelerating, and its acceleration is negative.

   C) The acceleration is zero.

   D) A statement cannot be made using the information given.

   Answer: B
   Diff: 1 *Page Ref: Sec. 2.4*

6) Suppose that a car traveling to the West (–*x* direction) begins to slow down as it approaches a traffic light. Make a statement concerning its acceleration.

   A) The car is decelerating, and its acceleration is positive.

   B) The car is decelerating, and its acceleration is negative.

   C) The acceleration is zero.

   D) A statement cannot be made using the information given.

   Answer: A
   Diff: 2 *Page Ref: Sec. 2.4*

7) Suppose that an object is moving with a constant velocity. Make a statement concerning its acceleration.

   A) The acceleration must be constantly increasing.

   B) The acceleration must be constantly decreasing.

   C) The acceleration must be a constant non–zero value.

   D) The acceleration must be equal to zero.

   Answer: D
   Diff: 1 *Page Ref: Sec. 2.4*

8) If the velocity of an object is zero, does it mean that the acceleration is zero? Support your answer with an example.

A) no, and an example would be an object starting from rest

B) no, and an example would be an object coming to a stop

C) yes, because of the way in which velocity is defined

D) yes, because of the way in which acceleration is defined

Answer: A
Diff: 1 *Page Ref: Sec. 2.4*

9) Can an object's velocity change direction when its acceleration is constant? Support your answer with an example.

A) No, this is not possible because it is always speeding up.

B) No, this is not possible because it is always speeding up or always slowing down, but it can never turn around.

C) Yes, this is possible, and a rock thrown straight up is an example.

D) Yes, this is possible, and a car that starts from rest, speeds up, slows to a stop, and then backs up is an example.

Answer: C
Diff: 2 *Page Ref: Sec. 2.4*

10) Suppose that an object is moving with constant acceleration. Make a statement concerning its motion with respect to time.

A) In equal times its speed increases by equal amounts.

B) In equal times its velocity changes by equal amounts.

C) In equal times it moves equal distances.

D) A statement cannot be made using the information given.

Answer: B
Diff: 2 *Page Ref: Sec. 2.4*

11) Can an object have increasing speed while its acceleration is decreasing? Support your answer with an example.

A) No, this is impossible because of the way in which acceleration is defined.

B) No, because if acceleration is decreasing the object will be slowing down.

C) Yes, and an example would be an object falling in the absence of air friction.

D) Yes, and an example would be an object released from rest in the presence of air friction.

Answer: D
Diff: 2 *Page Ref: Sec. 2.4*

12) Suppose a can, after an initial kick, moves up along a smooth hill of ice. Make a statement concerning its acceleration.

A) It will travel at constant velocity with zero acceleration.

B) It will have a constant acceleration up the hill, but a different constant acceleration when it comes back down the hill.

C) It will have the same acceleration, both up the hill and down the hill.

D) It will have a varying acceleration along the hill.

Answer: C
Diff: 3 *Page Ref: Sec. 2.4*

13) Under what condition is average velocity equal to the average of the object's initial and final velocity?

A) The acceleration must be constantly changing.

B) The acceleration must be constant.

C) This can only occur if there is no acceleration.

D) This is impossible.

Answer: B
Diff: 2 *Page Ref: Sec. 2.4*

14) Objects A and B both start at rest. They both accelerate at the same rate. However, object A accelerates for twice the time as object B. What is the final speed of object A compared to that of object B?

A) the same speed

B) twice as fast

C) three times as fast

D) four times as fast

Answer: B
Diff: 2 *Page Ref: Sec. 2.5–2.6*

15) Objects A and B both start from rest. They both accelerate at the same rate. However, object A accelerates for twice the time as object B. What is the distance traveled by object A compared to that of object B?

A) the same distance

B) twice as far

C) three times as far

D) four times as far

Answer: D
Diff: 2 *Page Ref: Sec. 2.5–2.6*

16) When an object is released from rest and falls in the absence of friction, which of the following is true concerning its motion?

A) The speed of the falling object is proportional to its mass.

B) The speed of the falling object is proportional to its weight.

C) The speed of the falling object is inversely proportional to its surface area.

D) None of the above is true.

Answer: D
Diff: 1 *Page Ref: Sec. 2.7*

17) When an object is released from rest and falls in the absence of friction, which of the following is true concerning its motion?

A) Its acceleration is constant.

B) Its velocity is constant.

C) Neither its acceleration nor its velocity is constant.

D) Both its acceleration and its velocity are constant.

Answer: A
Diff: 1 *Page Ref: Sec. 2.7*

18) Suppose a ball is thrown straight up. Make a statement about the velocity and the acceleration when the ball reaches the highest point.

A) Both its velocity and its acceleration are zero.

B) Its velocity is zero and its acceleration is not zero.

C) Its velocity is not zero and its acceleration is zero.

D) Neither its velocity nor its acceleration is zero.

Answer: B
Diff: 1 *Page Ref: Sec. 2.7*

19) Suppose a ball is thrown straight up. What is its acceleration just before it reaches its highest point?

A) zero

B) slightly less than g

C) exactly g

D) slightly greater than g

Answer: C
Diff: 1 *Page Ref: Sec. 2.7*

20) Suppose a ball is thrown straight up, reaches a maximum height, then falls to its initial height. Make a statement about the direction of the velocity and acceleration as the ball is going up.

A) Both its velocity and its acceleration point upward.

B) Its velocity points upward and its acceleration points downward.

C) Its velocity points downward and its acceleration points upward.

D) Both its velocity and its acceleration points downward.

Answer: B
Diff: 1 *Page Ref: Sec. 2.7*

21) A ball is thrown straight up, reaches a maximum height, then falls to its initial height. Make a statement about the direction of the velocity and acceleration as the ball is coming down.

A) Both its velocity and its acceleration point upward.

B) Its velocity points upward and its acceleration points downward.

C) Its velocity points downward and its acceleration points upward.

D) Both its velocity and its acceleration point downward.

Answer: D
Diff: 1 *Page Ref: Sec. 2.7*

22) Suppose a ball is thrown downward in the absence of air resistance. Make a statement concerning its acceleration.

A) Its acceleration is constantly increasing.

B) Its acceleration is constant.

C) Its acceleration is constantly decreasing.

D) Its acceleration is zero.

Answer: B
Diff: 1 *Page Ref: Sec. 2.7*

23) Suppose a skydiver jumps from a high–flying plane. What is her acceleration when she she reaches terminal velocity?

A) It is essentially zero.

B) It is in the upward direction.

C) It is approximately 9.8 m/s^2 downward.

D) It is a constant pointing upward.

Answer: A
Diff: 2 *Page Ref: Sec. 2.7*

24) A ball is thrown vertically upward with a speed v. An identical second ball is thrown upward with a speed 2v (twice as fast). What is the ratio of the maximum height of the second ball to that of the first ball? (How many times higher does the second ball go than the first ball?)

A) 4:1

B) 2:1

C) 1.7:1

D) 1.4:1

Answer: A
Diff: 2 *Page Ref: Sec. 2.7*

25) Ball A is dropped from the top of a building. One second later, ball B is dropped from the same building. As time progresses, the distance between them

A) increases.

B) remains constant.

C) decreases.

D) cannot be determined from the information given.

Answer: A
Diff: 3 *Page Ref: Sec. 2.7*

26) Ball A is dropped from the top of a building. One second later, ball B is dropped from the same building. As time progresses, the difference in their speeds

A) increases.

B) remains constant.

C) decreases.

D) cannot be determined from the information given.

Answer: B
Diff: 3 *Page Ref: Sec. 2.7*

27) Two objects are thrown from the top of a tall building. One is thrown up, and the other is thrown down, both with the same initial speed. What are their speeds when they hit the street?

A) The one thrown up is traveling faster.

B) The one thrown down is traveling faster.

C) They are traveling at the same speed.

D) It is impossible to tell because the height of the building is not given.

Answer: C
Diff: 2 *Page Ref: Sec. 2.7*

28) A brick is dropped from the top of a building. A second brick is thrown straight down from the same building. They are released at the same time. Neglect air resistance. Compare the accelerations of the two bricks.

A) The first brick accelerates faster.

B) The second brick accelerates faster.

C) The two bricks accelerate at the same rate.

D) It is impossible to determine from the information given.

Answer: C
Diff: 2 *Page Ref: Sec. 2.7*

29) An object is moving with constant non–zero velocity in the +x axis. The position versus time graph of this object is

A) a horizontal straight line.

B) a vertical straight line.

C) a straight line making an angle with the time axis.

D) a parabolic curve.

Answer: C
Diff: 1 *Page Ref: Sec. 2.8*

30) An object is moving with constant non–zero acceleration in the +x axis. The position versus time graph of this object is

A) a horizontal straight line.

B) a vertical straight line.

C) a straight line making an angle with the time axis.

D) a parabolic curve.

Answer: D
Diff: 1 *Page Ref: Sec. 2.8*

31) An object is moving with constant non–zero velocity in the +x axis. The velocity versus time graph of this object is

A) a horizontal straight line.

B) a vertical straight line.

C) a straight line making an angle with the time axis.

D) a parabolic curve.

Answer: A
Diff: 1 *Page Ref: Sec. 2.8*

32) An object is moving with constant non–zero acceleration in the +x axis. The velocity versus time graph of this object is

A) a horizontal straight line.

B) a vertical straight line.

C) a straight line making an angle with the time axis.

D) a parabolic curve.

Answer: C
Diff: 1 *Page Ref: Sec. 2.8*

33) The slope of a position versus time graph gives

A) position.

B) velocity.

C) acceleration.

D) displacement.

Answer: B
Diff: 1 *Page Ref: Sec. 2.8*

34) The slope of a velocity versus time graph gives

A) position.

B) velocity.

C) acceleration.

D) displacement.

Answer: C
Diff: 1 *Page Ref: Sec. 2.8*

35) The area under a curve in an acceleration versus time graph gives

A) acceleration.

B) velocity.

C) displacement.

D) position.

Answer: B
Diff: 2 *Page Ref: Sec. 2.8*

36) The area under a curve in a velocity versus time graph gives

A) acceleration.

B) velocity.

C) displacement.

D) position.

Answer: C
Diff: 2 *Page Ref: Sec. 2.8*

37) If the position versus time graph of an object is a horizontal line, the object is

A) moving with constant non–zero speed.

B) moving with constant non–zero acceleration.

C) at rest.

D) moving with infinite speed.

Answer: C
Diff: 1 *Page Ref: Sec. 2.8*

38) If the position versus time graph of an object is a vertical line, the object is

A) moving with constant non–zero speed.

B) moving with constant non–zero acceleration.

C) at rest.

D) moving with infinite speed.

Answer: D
Diff: 1 *Page Ref: Sec. 2.8*

39) If the velocity versus time graph of an object is a horizontal line, the object is

A) moving with constant non–zero speed.

B) moving with constant non–zero acceleration.

C) at rest.

D) moving with infinite speed.

Answer: A
Diff: 1 *Page Ref: Sec. 2.8*

40) If the velocity versus time graph of an object is a straight line making an angle of 30 degrees with the time axis, the object is

A) moving with constant non–zero speed.

B) moving with constant non–zero acceleration.

C) at rest.

D) moving with infinite speed.

Answer: B
Diff: 1 *Page Ref: Sec. 2.8*