Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Water, H_2O, is an example of a(n) 1) _____
A) type of energy.
B) chemical.
C) electric charge.
D) element.
E) wave.

2) In this list, which substance can be classified as a chemical? 2) _____
A) cold
B) salt
C) temperature
D) sleep
E) heat

3) One example of a chemical used in toothpaste is 3) _____
A) carbon dioxide.
B) chlorine.
C) calcium carbonate.
D) sugar.
E) sulfur.

4) Which of the following is NOT a chemical? 4) _____
A) water
B) sugar
C) salt
D) carbon dioxide
E) light

5) Sodium fluorophosphate is a chemical used in toothpaste to 5) _____
A) keep the paste from spoiling.
B) remove plaque.
C) strengthen tooth enamel.
D) make the paste white.
E) disinfect the toothbrush.

6) Titanium dioxide is a chemical used in toothpaste to 6) _____
A) keep the paste from spoiling.
B) strengthen tooth enamel.
C) make the toothpaste white.
D) remove plaque.
E) disinfect the toothbrush.

7) When a part of the body is injured, substances called _____ are released. 7) _____
A) pain relievers
B) chlorofluorocarbons
C) aspirins
D) nitrogen oxides
E) prostaglandins

8) Which of the following is a chemical? 8) _____
A) sugar B) heat C) sound D) noise E) light

9) You notice that there is more traffic between 8:00 and 9:00 AM. This would be a(n) 9) _____
A) experiment. B) observation.
C) hypothesis. D) conclusion/theory.

10) There is more traffic between 8:00 and 9:00 AM because most people start work at 9:00 AM. This would be a(n) 10) _____
A) conclusion/theory. B) observation.
C) experiment. D) hypothesis.

11) In order to enhance your learning in chemistry, you should NOT 11) _____
A) study a little every day.
B) wait until the night before the exam to study.
C) be an active learner.
D) go to professor's office hours.
E) form a study group.

12) Which of the following would NOT be part of a study plan to learn chemistry? 12) _____
A) skip your professor's office hours
B) study a little every day
C) read the chapter before class
D) work the sample problems
E) form a study group

13) In the number 12.345, the 4 is in the _____ place. 13) _____
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths

14) In the number 12.345, the 1 is in the _____ place. 14) _____
A) tens
B) ones
C) tenths
D) hundredths
E) thousandths

15) In the number 12.345, the 3 is in the _____ place. 15) _____

A) tens
B) ones
C) tenths
D) hundredths
E) thousandths

16) The product of (-4) × (-5) is 16) _____

A) 0 B) -20 C) .1 D) -1 E) .20

17) For the equation $4x + 2 = 10$, x equals 17) _____

A) 8 B) 12 C) -2 D) 3 E) 2

18) For the equation $6y - 20 = -2$, y equals 18) _____

A) -3 B) 4 C) 2 D) 3 E) -2

19) For the equation : -10 - (-4) = 19) _____

A) -14 B) 14 C) 4 D) 6 E) -6

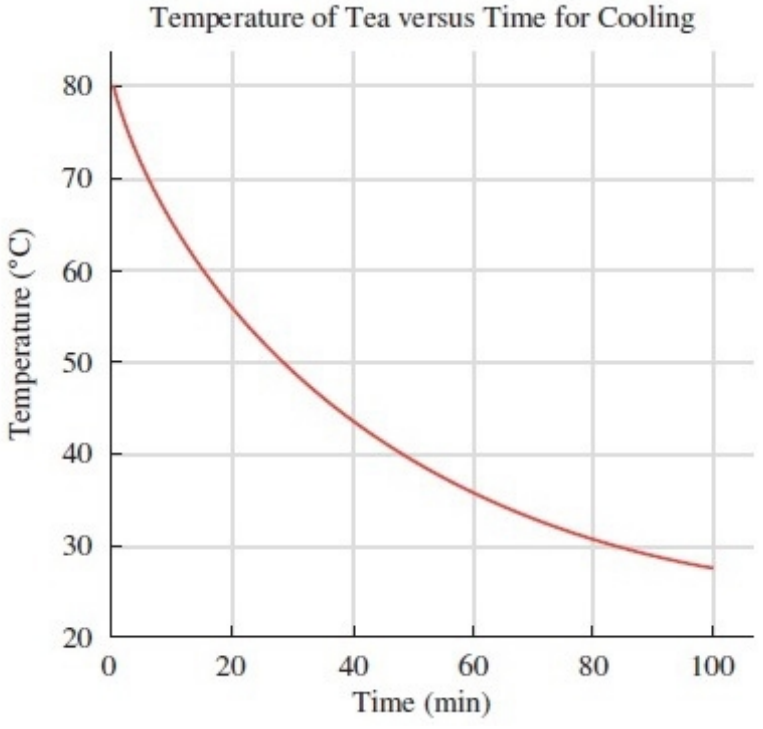
20) 12 is what percentage of 36? 20) _____

A) 33% B) 30% C) 12% D) 3% E) 330%

21) 16 is what percentage of 80? 21) _____

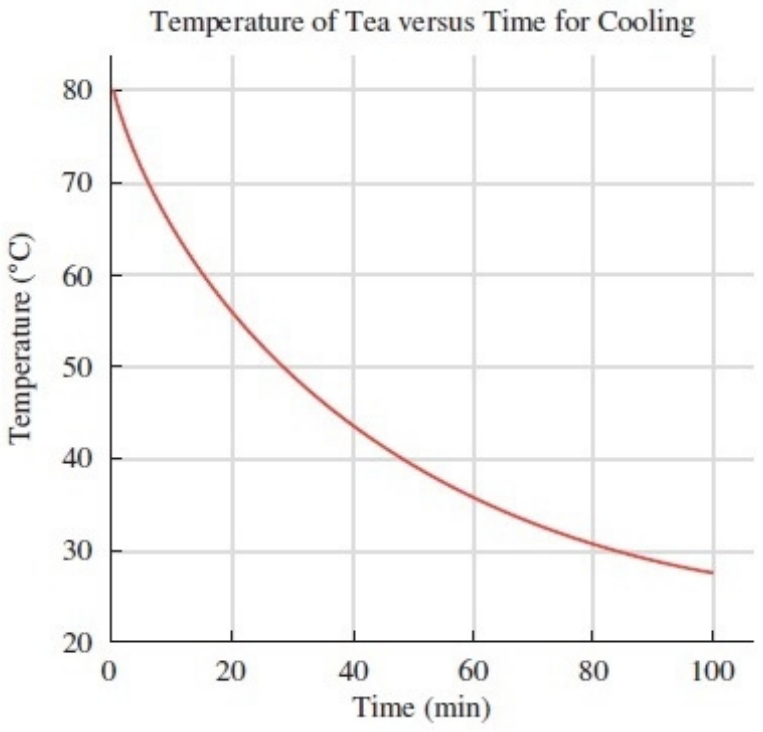
A) 2% B) 50% C) 20% D) 200% E) 5%

22) On the graph, what is the temperature after 40 minutes? 22) _____



A) 57 °C B) 26 °C C) 36 °C D) 40 °C E) 44 °C

23) On the graph, how long does it take to cool to from 80 °C go 45 °C? 23) _____



A) 60 min B) 75 min C) 25 min D) 42 min E) 35 min

24) Written in scientific notation, 540 000 is 24) _____

A) 5.4×10^{5}. B) 54×10^{8}. C) 5.4×10^{-5}. D) 0.54×10^{6}. E) 5.4.

25) Written in scientific notation, 8300 is 25) _____

A) 8.3×10^{-2}. B) 8.3×10^{2}. C) 8.3×10^{3}. D) 8.3×10^{-3}. E) 8.3×10^{4}.

26) Written in scientific notation, 0.000 000 33 is 26) _____

A) 3.3×10^{-8}. B) 3.3×10^{7}. C) 3.3×10^{8}. D) 3.3. E) 3.3×10^{-7}.

27) Written in scientific notation, 0.000 004 03 is 27) _____

A) 4.03×10^{-7}.
B) 4.03×10^{-6}.
C) 0.403×10^{-5}.
D) 4.03.
E) 4.03×10^{6}.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

28) A substance that always has the same composition and properties is called a(n) _____. 28) _____

29) Any material used in or produced by a chemical reaction is a(n) _____. 29) _____

30) An abrasive used in toothpaste is _____. 30) _____

31) The substances released when tissues are injured are _____. 31) _____

32) The chemical used to make cans and foil is _____. 32) _____

33) The first step in the scientific method is to _____. 33) _____

34) The second step in the scientific method is to _____. 34) _____

35) In the number 45.678, the digit 6 is in the _____ place. 35) _____

36) 40 students complete the first semester chemistry course. If 32 students take the second semester class, ____% are taking this class. 36) _____

37) Express using scientific notation: 351 000 000 000 37) _____

38) Express using scientific notation: 0.000 860 38) _____

39) Express using scientific notation: 5 207 000 39) _____

40) Express using scientific notation: 0.000 000 050 40) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

41) Titanium dioxide in toothpaste is used as a detergent. 41) _____

42) Calcium carbonate is used to sweeten toothpaste. 42) _____

43) Paracelsus was a Greek philosopher. 43) _____

44) The first step in the scientific method is to draw a conclusion. 44) _____

45) Doing experiments to test your hypothesis is part of the scientific method. 45) _____

46) If one experiment is successful, your hypothesis becomes a scientific theory. 46) _____

47) Working with a group of students can help you learn chemistry. 47) _____

48) Keeping a problem notebook will help you do well in your chemistry class. 48) _____

49) It is a good idea to wait until the night before an exam to start to study. 49) _____

50) You should always look at the given answer to a problem before you attempt to solve the problem. 50) _____

51) In the number 123.45, the digit 5 is in the hundreds place. 51) _____

52) In the number 123.45, the digit 3 is in the ones place. 52) _____

53) When -7 is added to -5 the answer is 12. 53) _____

54) If a negative number is divided by another negative number, the answer will be a positive number. 54) _____

55) If $-2x = 8$, x is equal to 4. 55) _____

56) If 12 students in a class of 36 students got an "A" grade on the exam, 33% of the students earned an "A". 56) _____

57) 3.5×10^{3} is equal to 3500. 57) _____

58) 2.25×10^{-4} is equal to 22500. 58) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

59) The SI base unit for length is the 59) _____
A) meter.
B) inch.
C) kilometer.
D) foot.
E) millimeter.

60) The metric unit for volume is the 60) _____
A) liter.
B) centimeter.
C) quart.
D) pint.
E) meter.

61) Which of the following is the basic unit of mass in the SI? 61) _____
A) microgram
B) gram
C) kilogram
D) milligram
E) pound

62) Which of the following is a measurement of mass in the metric system? 62) _____
A) meter B) kilogram C) milliliter D) Celsius E) centimeter

63) Which of the following is a measurement of temperature in the metric system? 63) _____
A) meter
B) degree Celsius
C) kilogram
D) degree Fahrenheit
E) lb

64) A value of 25 °C is a measurement of 64) _____
A) volume.
B) distance.
C) density.
D) temperature.
E) mass.

65) A value of 36 mL is a measure of 65) _____
A) mass.
B) density.
C) temperature.
D) volume.
E) distance.

66) A value of 345 cm is a measure of 66) _____
A) density.
B) volume.
C) temperature.
D) mass.
E) distance.

67) The amount of space occupied by a substance is its 67) _____
A) length. B) density. C) weight. D) mass. E) volume.

68) The measurement of the gravitational pull on an object is its 68) _____
A) volume. B) weight. C) length. D) mass. E) size.

69) Significant figures are important because they indicate 69) _____
A) the number of digits on a calculator.
B) the accuracy of the conversion factor.
C) the exact numbers in a measurement.
D) the number of measurements.
E) the certain and estimated digits in a measurement.

70) Which of the following measurements has three significant figures? 70) _____
A) 0.510 m B) 5100 m C) 0.005 m D) 510 m E) 0.051 m

71) Which of the following measured numbers contains the designated CORRECT number of significant figures? 71) _____
A) 3.0650 4 significant figures
B) 0.04300 5 significant figures
C) 1.04 2 significant figures
D) 0.00302 2 significant figures
E) 156 000 3 significant figures

72) The number of significant figures in the measurement of 45.030 mm is 72) _____
A) none. B) three. C) four. D) five. E) six.

73) How many significant figures are in the measured number 0.00208 m? 73) _____
A) two B) four C) five D) three E) six

74) Which of the following measurements has the same number of significant figures as the measured number 0.02030? 74) _____

A) 0.0067 B) 4.006 C) 510 D) 4600 E) 2.03×10^3

75) Which of the following examples illustrates a number that is correctly rounded to three significant figures? 75) _____

A) 103.692 grams to 103.7 grams
B) 0.03954 grams to 0.040 grams
C) 109,526 grams to 109 500 grams
D) 4.05438 grams to 4.054 grams
E) 20.0332 grams to 20.0 grams

76) A calculator answer of 423.6059 must be rounded off to three significant figures. What answer is reported? 76) _____

A) 423.7 B) 420 C) 423.6 D) 423 E) 424

77) Which of the answers for the following calculations contains the correct number of significant figures? 77) _____

A) $2.543 \text{ m} \times \frac{39.4 \text{ in}}{1 \text{ m}} = 100.1942 \text{ in}$

B) $12.0 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 370 \text{ cm}$

C) $24.0 \text{ kg} \times \frac{1 \text{ lb}}{2.20 \text{ kg}} = 11 \text{ lb}$

D) $2 \text{ L} \times \frac{1.06 \text{ qt}}{1 \text{ L}} = 2.12 \text{ qt}$

E) $24.95 \text{ min} \times \frac{1 \text{ h}}{60 \text{ min}} = 0.4158 \text{ h}$

78) What is the correct answer for the calculation of a volume (in mL) with measured numbers $\frac{28.58}{16 \times 8.02}$? 78) _____

A) 57 mL B) 14.3 mL C) 0.223 mL D) 0.22 mL E) 14 mL

79) A researcher added three samples of sodium chloride solution; the volumes were: 0.351 mL, 0.350 mL and 0.349 mL. The total volume should be reported as 79) _____

A) 1.050 mL.
B) 1.0 mL.
C) 1.0500 mL.
D) 1.1 mL.
E) 1.05 mL.

80) When 2610 + 11.7 + 0.22 are added, which of the following expresses the answer to the correct number of decimal places? 80) _____

A) 2620 B) 2621 C) 2621.92 D) 2600 E) 2621.9

81) What is the answer, with the correct number of decimal places, for this problem? 81) _____

4.392 g + 102.40 g + 2.51 g =

A) 109.3 g B) 109 g C) 110 g D) 109.302 g E) 109.30 g

82) The correct answer for the addition of 7.5 g + 2.26 g + 1.311 g + 2 g is 82) _____

A) 13 g. B) 10 g. C) 13.1 g. D) 13.071 g. E) 13.0 g.

83) What is the correct answer for the calculation $\frac{36 \times 0.12345}{6.77}$? 83) _____

A) 1.52 B) 0.66 C) 0.656 D) 0.65645 E) 1.5

84) 5.21 cm is the same distance as 84) _____

A) 5210 m.
B) 0.00521 km.
C) 5.21 mm.
D) 0.0521 m.
E) 52.1 dm.

85) Which of the following measurements are NOT equivalent? 85) _____

A) 84 cm = 8.4 mm
B) 24 dL = 2.4 L
C) 25 mg = 0.025 g
D) 150. ms = 0.150 s
E) 183 L = 0.183 kL

86) In which of the following is the metric unit paired with its correct abbreviation? 86) _____

A) milliliter / mL
B) microgram / mg
C) centimeter / km
D) kilogram / cg
E) gram / gm

87) Which of the following is the largest unit? 87) _____

A) kilometer
B) micrometer
C) millimeter
D) meter
E) decimeter

88) What is the relationship between grams and micrograms? 88) _____

A) 1 g = 1 000 000 µg
B) 1 g = 100 µg
C) 1 g = 0.001 µg
D) 1 g = 1000 µg
E) 1 g = 0.000 001 µg

89) Which of the following is the smallest unit? 89) _____

A) gram
B) kilogram
C) milligram
D) decigram
E) microgram

90) The cubic centimeter (cm^3 or cc) has the same volume as a 90) _____

A) cubic liter.
B) milliliter.
C) cubic decimeter.
D) cubic inch.
E) centimeter.

91) 9.31 g is the same mass as 91) _____

A) 931 kg. B) 931 µg. C) 93.1 cg. D) 0.0931 dg. E) 9310 mg.

92) In which of the following is the metric unit paired with its correct abbreviation? 92) _____

A) milliliter / mcL
B) centimeter / cmm
C) microgram / Mg
D) kilogram / Kg
E) microgram / mcg

93) What is the conversion factor for the relationship between millimeters and centimeters? 93) _____

A) 10 cm/1 mm
B) 100 mm/1 cm
C) 10 mm/1 cm
D) 1 mm/1 cm
E) 1 cm/1 mm

94) A conversion factor set up correctly to convert 15 inches to centimeters is 94) _____

A) 1 cm/10 mm.
B) 100 cm/1 m.
C) 10 cm/1 inch.
D) 1 inch/2.54 cm.
E) 2.54 cm/1 inch.

95) Which of the following conversion factors is a measured number? 95) _____

A) 16 oz/lb
B) 10 cm/dm
C) 12 eggs/dozen
D) 12 in/ft
E) 25 miles/gallon

96) Parts per million (ppm) is the same as: 96) _____

A) grams per kilogram
B) micrograms per kilogram
C) kilograms per milligram
D) milligrams per kilogram
E) parts per hundred

97) According to the United States Food and Drug Administration, the recommended daily requirement of protein is 44 g. This is _____ oz of protein. 97) _____

A) 1248.5 B) 0.0605 C) 320 000 D) 150 000 E) 1.6

98) Which of the following setups would convert centimeters to feet? 98) _____

A) $\text{cm} \times \frac{2.54 \text{ in.}}{1 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

B) $\text{cm} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

C) $\text{cm} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} \times \frac{12 \text{ in.}}{1 \text{ ft}}$

D) $\text{cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in.}}$

E) $\text{cm} \times \frac{1 \text{ in.}}{2.54 \text{ cm}} \times \frac{12 \text{ in.}}{1 \text{ ft}}$

99) The EPA limit for lead in the soil of play areas is 400 ppm. This is the same as 99) _____

A) 400 g lead in each kilogram of soil.
B) 400 µg lead in each kilogram of soil.
C) 400 mg lead in each gram of soil.
D) 400 µg lead in each milligram of soil.
E) 400 mg lead in each kilogram of soil.

100) How many pounds are in 3.5 kg? 100) _____

A) 7.70 lb B) 7.7 lb C) 1.6 lb D) 0.629 lb E) 1.59 lb

101) How many centimeters are there in 57.0 in.? 101) _____

A) 22.4 cm B) 22 cm C) 0.0445 cm D) 140 cm E) 145 cm

102) How many kilograms are in 30.4 lb? 102) _____

A) 13.8 kg B) 66.9 kg C) 67 kg D) 66.88 kg E) 14 kg

103) How many liters of soft drink are there in 5.25 qt? 103) _____

A) 4.95 L B) 5.0 L C) 55.7 L D) 5.57 L E) 4950 L

104) What is 6.5 m converted to inches? 104) _____

A) 260 in B) 255.9 in C) 1700 in D) 39 in E) 1651 in

105) 1.00 pint of milk has a volume of how many milliliters? (2 pints = 1 quart) 105) _____

A) 530. mL B) 1000 mL C) 1890 mL D) 106 mL E) 472 mL

106) What is the volume of a cube that measures 4.00 cm on each side? 106) _____
A) 64.0 L B) 64.00 mL C) 16.0 mL D) 0.640 L E) 64.0 mL

107) Grapes are $1.49 per pound. What is the cost of 1.20 kg of grapes? 107) _____
A) $2.73 B) $0.56 C) $1.79 D) $3.94 E) $0.81

108) A driver is traveling at 60 km/h. Is the driver speeding if the speed limit is 45 mph? 108) _____
A) Yes B) No

109) How many kilograms are in 30.4 lb? 109) _____
A) 13.8 kg B) 66.9 kg C) 14 kg D) 67 kg E) 66.88 kg

110) A dose of aspirin of 5.0 mg per kilogram of body weight has been prescribed to reduce the fever of an infant weighing 8.5 pounds. The number of milligrams of aspirin that should be administered is 110) _____
A) 19 mg. B) 1.6 mg. C) 53 mg. D) 0.59 mg. E) 5.0 mg.

111) A doctor's order is 0.125 g of ampicillin. The liquid suspension on hand contains 250 mg/5.0 mL. How many milliliters of the suspension are required? 111) _____
A) 6.3 mL B) 3.0 mL C) 0.0063 mL D) 2.5 mL E) 0.0025 mL

112) A nugget of gold with a mass of 521 g is added to 50.0 mL of water. The water level rises to a volume of 77.0 mL. What is the density of the gold? 112) _____
A) 6.77 g/mL
B) 1.00 g/mL
C) 10.4 g/mL
D) 0.0518 g/mL
E) 19.3 g/mL

113) Which one of the following substances will float in gasoline, which has a density of 0.66 g/mL? 113) _____
A) aluminum (density = 2.70 g/mL)
B) table salt (density = 2.16 g/mL)
C) mercury (density = 13.6 g/mL)
D) balsa wood (density = 0.16 g/mL)
E) sugar (density = 1.59 g/mL)

114) What is the mass of 2.00 L of an intravenous glucose solution with a density of 1.15 g/mL? 114) _____
A) 2.30 kg B) 1.15 kg C) 0.58 kg D) 0.023 kg E) 0.015 kg

115) Mercury has a specific gravity of 13.6. How many milliliters of mercury have a mass of 0.35 kg? 115) _____
A) 0.0257 mL B) 25.7 mL C) 26 mL D) 0.026 mL E) 4760 mL

116) What is the density of a substance with a mass of 45.00 g and a volume of 26.4 mL? 116) _____
A) 45.0 g/mL
B) 1.70 g/mL
C) 0.587 g/mL
D) 1.7 g/mL
E) 0.59 g/mL

117) A liquid has a volume of 34.6 mL and a mass of 46.0 g. What is the density of the liquid? 117) _____
A) 1.33 g/mL
B) 1.00 g/mL
C) 0.752 g/mL
D) 0.663 g/mL
E) 1330 g/mL

118) What is the mass of 53 mL of ethanol, which has a density of 0.79 g/mL? 118) _____
A) 42 g B) 67.1 g C) 67 g D) 53 g E) 41.9 g

119) The density of a solution is 0.847 g/mL. Its specific gravity is 119) _____
A) 0.118. B) 11.8. C) 1.2. D) 1.18. E) 0.847.

120) The specific gravity of a solution is 1.18. Its density is 120) _____
A) 0.847 g/mL.
B) 11.8 g/mL.
C) 1.2 g/mL.
D) 1.18 g/mL.
E) 0.118 g/mL.

121) Diamond has a density of 3.52 g/mL. What is the volume in cubic centimeters of a diamond with a mass of 15.1 g? 121) _____
A) 53.2 cm^3 B) 4.3 cm^3 C) 53 cm^3 D) 0.233 cm^3 E) 4.29 cm^3

122) The ratio of the mass of a substance to its volume is its 122) _____
A) buoyancy.
B) specific gravity.
C) conversion factor.
D) density.
E) weight.

123) Which of the following is often used to determine an individual's percentage of body fat? 123) _____
A) weight loss
B) density
C) temperature
D) weight gain
E) height

124) A 50.0 mL urine sample has a mass of 50.7 g. The specific gravity of the urine is 124) _____
A) 0.986 g/L.
B) 50.7.
C) 1.014 g/mL.
D) 1.01.
E) 0.986.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Round off each of the following to three significant figures.

125) 504.85 125) _____

126) 8.3158 126) _____

127) 25 225 127) _____

128) 58.5422 128) _____

129) 6.3477×10^4 129) _____

130) 399870 130) _____

131) 0.003 408 8 131) _____

State the number of significant figures in each of the following measurements.

132) 0.008 090 cm 132) _____

133) 680 000 km 133) _____

134) 28.050 km 134) _____

135) 0.0005 L 135) _____

136) 75.00 m 136) _____

137) 2.043×10^4 mm 137) _____

138) 6.1×10^{-5} mL 138) _____

139) 9.00×10^6 g 139) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

140) The basic unit of mass in the metric system is the pound. 140) _____

141) The liter is a unit of volume in the metric system. 141) _____

142) The kelvin is a unit of length in the metric system. 142) _____

143) The number 0.0500 has four significant figures. 143) _____

144) The number 650 000 has two significant figures. 144) _____

145) The number 3.10×10^3 has two significant figures. 145) _____

146) When the measured number 0.0090 is multiplied by the measured number 87.10, the answer has two significant figures. 146) _____

147) When the measured number 675 is added to the measured number 87.10, the answer should be rounded to the ones place. 147) _____

148) A µg is larger than a mg. 148) _____

149) There are 1000 µg in a mg. 149) _____

150) A cubic centimeter is a unit of length. 150) _____

151) 1 kilogram is the same as 1000 mg. 151) _____

152) 1 milliliter is the same as 1000 L. 152) _____

153) There are 1000 cm in one meter. 153) _____

154) A conversion factor between mL and L is 1000 L/1 mL. 154) _____

155) A distance of 6.3 inches is the same as 16 cm. 155) _____

156) A stone that weighs 3.6 lbs has a mass of 7.9 kg. 156) _____

157) The density of water is 1 kg/mL. 157) _____

158) Specific gravity has no units. 158) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

Match the type of measurement to the unit given below.

159) milliliter	A) temperature	159) _____
160) mm	B) density	160) _____
161) gram	C) distance	161) _____
162) K	D) volume	162) _____
163) kilometer	E) mass	163) _____
164) milligram		164) _____

Are the numbers in each of the following statements measured or exact?

A) measured

B) exact

165) In the U.S. system there are 5280 feet in one mile. 165) _____

166) The patient's blood sugar level is 350 mg/dL. 166) _____

167) There are 452 pages in a book. 167) _____

168) The rabbit weighs 2.5 pounds. 168) _____

169) There are 100 capsules in the bottle. 169) _____

170) I lost 14 pounds on my diet last month. 170) _____

171) 1 liter is equal to 1.06 quarts. 171) _____

172) The patient's temperature is 100.1 °F. 172) _____

Select the correct prefix to complete the equality.

A) 0.1

B) 1×10^{12}

C) 10

D) 1000

E) 1

F) 1×10^{-12}

G) 100

H) 0.01

I) 0.001

173) 1 g = _____ kg 173) _____

174) 1 m = _____ mm 174) _____

175) 1 cm = _____ mm 175) _____

176) 1 dL = _____ mL 176) _____

177) 1 kg = _____ g 177) _____

178) 1 pg = _____ g 178) _____

179) 1 g = _____ pg 179) _____

180) 1 mL = _____ cc 180) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

181) Helium is a(n) 181) _____

A) electron.
B) element.
C) heterogeneous mixture.
D) compound.
E) homogeneous mixture.

182) Air is a(n) 182) _____
A) compound.
B) heterogeneous mixture.
C) element.
D) homogeneous mixture.

183) Coins in a piggy bank is a(n) 183) _____
A) compound.
B) heterogeneous mixture.
C) element.
D) homogeneous mixture.

184) A gold ingot is a(n) 184) _____
A) compound.
B) heterogeneous mixture.
C) element.
D) homogeneous mixture.

185) The primary substances of which all other things are composed are 185) _____
A) protons.
B) molecules.
C) elements.
D) electrons.
E) compounds.

186) An ice cream sundae is a(n) 186) _____
A) compound.
B) heterogeneous mixture.
C) element.
D) homogeneous mixture.

187) Which of the following is a property of a solid? 187) _____
A) It takes the shape of the container.
B) It fills the volume of the container.
C) The particles have fixed positions and are very close together.
D) The interactions between its particles are very weak.
E) The particles move at a rapid rate.

188) Which of the following is a physical property of both liquids and gases? 188) _____
A) has randomly arranged particles
B) has strong interactions between its particles
C) has a definite volume
D) has a definite shape
E) has large spaces between molecules

189) Which one of the following properties describes a liquid? 189) _____
A) fills the entire volume of the container
B) has a definite shape
C) particles are close together and move randomly
D) particles move very rapidly
E) There is essentially no interaction between the particles.

190) In a gas, the distance between the particles is 190) _____
A) close relative to the size of the molecules.
B) fixed relative to the size of the molecules.
C) very large relative to the size of the molecules.
D) small relative to the size of the molecules.
E) very close relative to the size of the molecules.

191) Which of the following is an example of a physical change? 191) _____
A) converting water to hydrogen and oxygen
B) baking a cake
C) burning coal
D) grinding coffee beans
E) digesting a cheeseburger

192) Which of the following would NOT be a physical change? 192) _____
A) burning gasoline in a lawnmower
B) tearing a piece of aluminum foil
C) melting gold to make jewelry
D) freezing water to make ice cubes
E) boiling water for soup

193) Which of the following is a chemical change? 193) _____
A) melting gold
B) making a snowman
C) bending a steel rod
D) cutting a rope
E) burning sugar

194) Which of the following is a physical change? 194) _____
A) baking a cake
B) a tomato ripening
C) dry ice subliming
D) fermenting grapes to produce wine
E) digesting a meal

195) A temperature of 41 °F is the same as 195) _____
A) 5 °C. B) 42 °C. C) 310 °C. D) -9 °C. E) 16 °C.

196) If the temperature is 20 °C, what is the corresponding temperature on the Fahrenheit scale? 196) _____
A) 239 °F B) -22 °F C) 68 °F D) 94 °F E) 43 °F

197) If the temperature is -55 °C, what is the corresponding temperature on the Kelvin scale? 197) _____
A) 328 K B) 218 K C) 55 K D) 273 K E) 225 K

198) A patient has a temperature of 38.5 °C. What is the temperature in degrees Fahrenheit? 198) _____
A) 311.0 °F B) 70.5 °F C) 101.3 °F D) 126.9 °F E) 11.7 °F

199) The temperature of liquid nitrogen is -196 °C. What is the corresponding reading on the Kelvin scale? 199) _____
A) -127 K B) -91 K C) 48 K D) 146 K E) 77 K

200) On a hot day, the thermometer read 95 °F. What is the temperature in degrees Celsius? 200) _____
A) 113 °C B) 63 °C C) 35 °C D) 178 °C E) 77 °C

201) Absolute zero is 201) _____
A) the temperature on the Kelvin scale corresponding to 32 °F.
B) the freezing point of liquid nitrogen.
C) the freezing point of water using the Celsius scale.
D) the coldest temperature possible.
E) the boiling point of liquid nitrogen.

202) On the Celsius scale, 0 °C is 202) _____
A) the coldest temperature possible.
B) the temperature on the Kelvin scale corresponding to 32 °F.
C) the boiling point of water
D) the same as 0 K.
E) the freezing point of water.

203) 650. J is the same amount of energy as 203) _____
A) 1550 cal. B) 2.72 cal. C) 155 cal. D) 2720 cal. E) 650 cal.

204) The energy associated with the motion of particles in a substance is called 204) _____
A) heat.
B) electrical energy.
C) temperature.
D) potential energy.
E) chemical energy.

205) An example of kinetic energy is 205) _____
A) a coiled spring.
B) running water.
C) a tree.
D) chemical energy.
E) natural gas.

206) Which of the following is an example of potential energy? 206) _____
A) burning wood
B) a fan blade turning
C) chewing food
D) water stored in a reservoir
E) riding an exercise bike

207) The phrase "ability to do work" is a definition of 207) _____
A) specific heat.
B) heating.
C) cooling.
D) calorie.
E) energy.

208) The energy stored in the chemical bonds of a carbohydrate molecule is 208) _____
A) work.
B) a calorie.
C) kinetic energy.
D) specific heat.
E) potential energy.

209) The energy of motion is referred to as 209) _____
A) freezing.
B) kinetic energy.
C) specific heat.
D) potential energy.
E) work.

210) In which of the following would the particles move most rapidly? 210) _____
A) boiling water
B) water at 20 °C
C) steam at 110 °C
D) ice at 0 °C
E) ice at -20 °C

211) 3.25 kcal is the same amount of energy as 211) _____
A) 13600 J. B) 777 J. C) 0.777 J. D) 13.6 J. E) 3.25 J.

212) A 2.5 g sample of french fries is placed in a calorimeter with 500.0 g of water at an initial temperature of 21 °C. After combustion of the french fries, the water has a temperature of 48 °C. What is the caloric value (kcal/g) of the french fries? 212) _____
A) 0.14 kcal/g B) 5.4 kcal/g C) 4.2 kcal/g D) 14 kcal/g E) 11 kcal/g

213) A potato contains 20 g of carbohydrate. If carbohydrate has a caloric value of 4 kcal/g, how many kcal are obtained from the carbohydrate in the potato? 213) _____
A) 40 kcal B) 60 kcal C) 80 kcal D) 5 kcal E) 20 kcal

214) The dietary calorie (Cal) is equal to 214) _____
A) 1000 calories.
B) 1 calorie.
C) 10 calories.
D) 1000 kilocalories.
E) 100 calories.

215) A cheeseburger from a fast food restaurant contains 19 g of fat, 20. g of carbohydrate, and 28 g of protein. How many kcal of energy does the cheeseburger contain? (The caloric values for foods are 9.0 kcal/g for fat, 4.0 kcal/g for carbohydrate, and 4.0 kcal/g for protein.) Round off the answer for each food type to the tens place. 215) _____
A) 630 kcal B) 17 kcal C) 360 kcal D) 280 kcal E) 70. kcal

216) A serving of fish contains 50.g of protein and 4.0 g of fat. If protein has a caloric value of 4.0 kcal/g and fat has 9.0 kcal/g, how many kcal are in the serving? Round off the answer for each food type to the tens place. 216) _____
A) 220 kcal B) 490 kcal C) 240 kcal D) 470 kcal E) 54.0 kcal

217) A slice of pizza contains 29 g of carbohydrate, 13 g of protein and an unknown amount of fat. If the pizza contains 280 kcal, how many grams of fat are present? (The caloric values for foods are 4.0 kcal/g for carbohydrate, 4.0 kcal/g for protein, and 9.0 kcal/g for fat.) Round off the answer for each food type to the tens place. 217) _____
A) 25 g B) 55 g C) 10. g D) 12 g E) 250 g

218) A diet has a total caloric intake of 1400 kcal. If the protein in the diet provides 35% of the kcal, the number of kcal of protein in the diet is 218) _____
A) 210 kcal. B) 700 kcal. C) 460 kcal. D) 490 kcal. E) 1200 kcal.

219) One cup of kidney beans contains 15 g of protein, 1.0 g of fat, and 42 g of carbohydrate. How many kilocalories does this contain? (The caloric values for foods are 4.0 kcal/g for protein, 9.0 kcal/g for fat, and 4.0 kcal/g for carbohydrate.) Round off the answer for each food type to the tens place. 219) _____
A) 60 kcal B) 230 kcal C) 520 kcal D) 250 kcal E) 88 kcal

220) A taco from a fast food restaurant contains 7.0 g of fat, 25. g of carbohydrate, and 11 g of protein. How many kJ of energy does the cheeseburger contain? (The caloric values for foods are 38 kJ/g for fat, 17 kJ/g for carbohydrate, and 17 kJ/g for protein.) Round off the answer for each food type to the tens place. 220) _____
A) 70 kJ B) 43 kJ C) 1100 kJ D) 210 kJ E) 890 kJ

221) The specific heat of a substance is the amount of heat needed to 221) _____
A) convert 1 g of a solid to a gas.
B) convert 1 g of a liquid to gas.
C) change 1 g of the substance from the solid to the liquid state.
D) raise the temperature of 1 g of the substance by 1 °C.
E) change 1 g of the substance from the liquid to the solid state.

222) A kilocalorie of heat is required to raise the temperature of 222) _____
A) 100 g of water by 10 °C.
B) 10 g of water by 10 °C.
C) 1 g of water from 14 °C to 15 °C.
D) 100 g of water by 100 °C.
E) 1 g of water by 10 °C.

223) How many calories are required to raise the temperature of a 35.0 g sample of iron from 25 °C to 35 °C? Iron has a specific heat of 0.108 cal/g °C. 223) _____
A) 1.1 cal B) 130 cal C) 38 cal D) 93 cal E) 3.8 cal

224) How many calories are required to increase the temperature of 13 g of ethanol from 11 °C to 23 °C? The specific heat of alcohol is 0.588 cal/g °C. 224) _____
A) 170 cal B) 92 cal C) 0.54 cal D) 83 cal E) 0.63 cal

225) How many calories are required to raise the temperature of a 150. g sample of gold from 25 °C to 175 °C? The specific heat of gold is 0.0308 cal/g °C. 225) _____
A) 22500 cal B) 693 cal C) 4.62 cal D) 130 cal E) 116 cal

226) Raising the temperature of 10.0 g of water from 10.0 °C to 20.0 °C requires 100.0 cal of energy, while raising the temperature of 10.0 g of aluminum from 10.0 °C to 20.0 °C requires 22 cal. More calories are required to heat the water because 226) _____
A) ten grams of water occupies a larger volume than 10.0 g of aluminum.
B) water is a liquid and aluminum is a solid at 10.0 °C.
C) 10.0 °C is closer to the melting point of water than to the melting point of aluminum.
D) water has a greater potential energy than aluminum.
E) water has a larger specific heat than aluminum.

227) The number of calories needed to raise the temperature of 32 g of water from 12 °C to 54 °C is 227) _____
A) 0.76 cal. B) 1700 cal. C) 1300 cal. D) 1.3 cal. E) 384 cal.

228) The specific heat of copper is 0.0920 cal/g °C, and the specific heat of silver is 0.0562 cal/g °C. If 100 cal of heat is added to one g of each metal at 25 °C, what is the expected result? 228) _____
A) The silver will reach a temperature lower than 25 °C.
B) The copper will reach a temperature lower than 25 °C.
C) The silver will reach a higher temperature.
D) The two samples will reach the same temperature.
E) The copper will reach a higher temperature.

229) How many joules are required to raise the temperature of a 6.50 g sample of silver from 34 °C to 189 °C? The specific heat of gold is 0.235 J/g °C. 229) _____
A) 255 J B) 289 J C) 237 J D) 51.9 J E) 127 J

230) A burn from steam at 100 °C is expected to be more severe than a burn from boiling water at 100 °C because 230) _____
A) you are more likely to come into contact with the steam than with the boiling water.
B) the steam is hotter than the boiling water.
C) there is more steam than water.
D) the steam will give off a larger amount of heat as it condenses.

231) The physical state(s) present when a substance is melting is (are) 231) _____
A) solid + liquid.
B) solid.
C) liquid.
D) liquid + gas.
E) gas.

232) The formation of a gas resulting from the escape of high-energy particles from the surface of a liquid is known as 232) _____
A) boiling.
B) melting.
C) sublimation.
D) deposition.
E) evaporation.

233) When a solid is converted directly to a gas, the change of state is called 233) _____
A) boiling.
B) melting.
C) freezing.
D) sublimation.
E) condensation.

234) Which of the following does NOT involve a change of state? 234) _____
A) freezing water
B) pouring water into a vacuum-insulated bottle
C) vaporization of alcohol
D) sublimation of dry ice
E) melting ice

235) A heating curve illustrates 235) _____
A) the chemical changes that occur as the substance is heated.
B) what happens to the particles of a substance as it is heated.
C) the changes in the temperature and physical state of a substance as it is heated.
D) what a substance looks like as it is heated.
E) what happens to the heat applied as the temperature is increased.

236) Which of the following does NOT represent a step on the heating curve of water? 236) _____
A) The temperature of liquid water increases linearly as it is heated.
B) The temperature of ice remains at 0 °C as it melts.
C) The temperature of liquid water remains at 100 °C as it boils.
D) The temperature of steam cannot exceed 100 °C.
E) Both liquid water and ice are present at 0 °C.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

237) The simplest type of pure substance is a(n) _____. 237) _____

238) A mixture which has uniform properties is a(n) _____ mixture. 238) _____

239) A color of a substance is an example of a(n) _____ property. 239) _____

240) A reaction of a substance with water is an example of a(n) _____ property. 240) _____

241) The lowest temperature on the Kelvin scale is _____ K. 241) _____

242) The boiling point of water on the Celsius scale is _____ °C. 242) _____

243) The energy of motion is called _____ energy. 243) _____

244) 1 calorie is the same amount of energy as _____ joules. 244) _____

245) 100. J is the same amount of energy as _____ kcal. 245) _____

246) The nutritional calorie (Cal) is the same as _____ cal. 246) _____

247) Will the caloric value of a 100. g hamburger be higher or lower than the caloric value of 100. g of sugar? 247) _____

248) Will the caloric value of a 100.g hamburger be higher or lower than the caloric value of 100. g of cooking oil? 248) _____

249) The units of specific heat are _____. 249) _____

250) _____ cal are required to raise the temperature of 10.0 g of water by 45 °C. 250) _____

251) The change of state directly from solid to gas is termed _____. 251) _____

252) When a liquid boils, the process by which the molecules leave its surface is called _____. 252) _____

Bromine (Br_2) has a freezing point of -7 °C, and a boiling point of 60 °C.
Indicate the state or change of state occurring at each temperature.

253) 30 °C 253) _____

254) 60 °C 254) _____

255) -7 °C 255) _____

256) -15 °C 256) _____

257) 70 °C 257) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

258) Gold is an element. 258) _____

259) Black coffee is a homogeneous mixture. 259) _____

260) A solid has a definite shape and volume. 260) _____

261) Molecules of a gas are very close together. 261) _____

262) Water vapor is a gas. 262) _____

263) The yellow-green color of chlorine is a chemical property. 263) _____

264) Fluorine etches glass. This is a chemical property of fluorine. 264) _____

265) Water freezes at 100 °C. 265) _____

266) 32 °F is the same temperature as 100 °C. 266) _____

267) The energy in chemical bonds is kinetic energy. 267) _____

268) 1000. kcal is the same amount of energy as 4184 kJ. 268) _____

269) Carbohydrates and proteins have the same caloric value per gram. 269) _____

270) Carbohydrates have a higher caloric value per gram than fats. 270) _____

271) The units of specific heat are cal g/°F. 271) _____

272) It takes 50. cal to raise the temperature of 10. g of water by 5.0 °C. 272) _____

273) Condensation occurs when a liquid is converted to a solid. 273) _____

274) As heat is removed from a solid, its temperature decreases. 274) _____

275) When a liquid is boiling, its temperature does not change. 275) _____

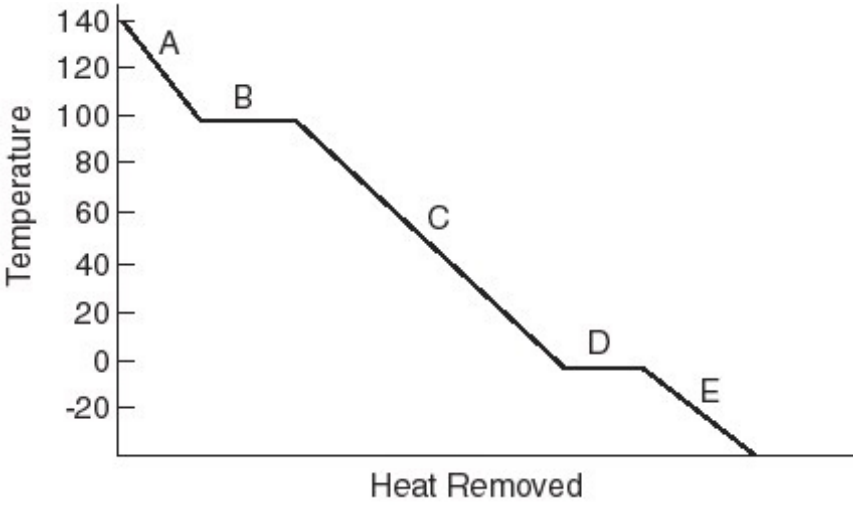
276) Condensation occurs when a liquid is converted to a solid. 276) _____

277) As a solid melts, its temperature does not change. 277) _____

278) The temperature at which water melts and freezes is the same. 278) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

Identify the physical state(s) corresponding to the regions on the cooling curve below.



279) A	A) gas	279) _____
280) B	B) liquid	280) _____
281) C	C) solid and gas	281) _____
282) D	D) solid	282) _____
283) E	E) liquid and solid	283) _____
	F) liquid and gas	

Match the state of matter with each of the following descriptions of a substance.

284) Particles are held close together in a random pattern. 284) _____

285) Great distances exist between the particles. 285) _____

286) This substance is boiling. 286) _____

287) This material has a definite volume, and a definite shape. 287) _____

288) This substance is melting. 288) _____

A) gas

B) solid + liquid

C) solid

D) liquid

E) liquid + gas

Identify each of the following transformations as a chemical or physical change

289) water evaporating 289) _____

290) a button falling off of a shirt 290) _____

291) silver tarnishing 291) _____

292) cutting the grass 292) _____

293) a nail rusting 293) _____

294) baking a cake 294) _____

295) placing photographs in a scrapbook 295) _____

296) formation of green leaves on a plant 296) _____

297) burning leaves 297) _____

298) melting ice 298) _____

A) chemical

B) physical

1) B
2) B
3) C
4) E
5) C
6) C
7) E
8) A
9) B
10) D
11) B
12) A
13) D
14) A
15) C
16) E
17) E
18) D
19) E
20) A
21) C
22) E
23) D
24) A
25) C
26) E
27) B
28) chemical
29) chemical
30) calcium carbonate
31) prostaglandins
32) aluminum
33) make observations
34) form a hypothesis
35) tenths
36) 80
37) 3.51×10^{11}
38) 8.60×10^{-4}
39) 5.207×10^{6}
40) 5.0×10^{-8}
41) FALSE
42) FALSE
43) FALSE
44) FALSE
45) TRUE
46) FALSE
47) TRUE
48) TRUE
49) FALSE

50) FALSE
51) FALSE
52) TRUE
53) FALSE
54) TRUE
55) FALSE
56) TRUE
57) TRUE
58) FALSE
59) A
60) A
61) C
62) B
63) B
64) D
65) D
66) E
67) E
68) B
69) E
70) A
71) E
72) D
73) D
74) B
75) E
76) E
77) E
78) D
79) A
80) A
81) E
82) A
83) B
84) D
85) A
86) A
87) A
88) A
89) E
90) B
91) E
92) E
93) C
94) E
95) E
96) D
97) E
98) D
99) E

100) B
101) E
102) A
103) A
104) A
105) E
106) E
107) D
108) B
109) A
110) A
111) D
112) E
113) D
114) A
115) C
116) B
117) A
118) A
119) E
120) D
121) E
122) D
123) B
124) D
125) 505
126) 8.32
127) 25 200
128) 58.5
129) 6.35×10^4
130) 4.00×10^5
131) 0.003 41
132) 4
133) 2
134) 5
135) 1
136) 4
137) 4
138) 2
139) 3
140) FALSE
141) TRUE
142) FALSE
143) FALSE
144) TRUE
145) FALSE
146) TRUE
147) TRUE
148) FALSE

149) TRUE
150) FALSE
151) FALSE
152) FALSE
153) FALSE
154) FALSE
155) TRUE
156) FALSE
157) FALSE
158) TRUE
159) D
160) C
161) E
162) A
163) C
164) E
165) B
166) A
167) B
168) A
169) B
170) A
171) A
172) A
173) I
174) D
175) C
176) G
177) D
178) F
179) B
180) E
181) B
182) D
183) B
184) C
185) C
186) B
187) C
188) A
189) C
190) C
191) D
192) A
193) E
194) C
195) A
196) C
197) B
198) C

199) E
200) C
201) D
202) E
203) C
204) A
205) B
206) D
207) E
208) E
209) B
210) C
211) A
212) B
213) C
214) A
215) C
216) C
217) D
218) D
219) D
220) E
221) D
222) A
223) C
224) B
225) B
226) E
227) C
228) C
229) C
230) D
231) A
232) E
233) D
234) B
235) C
236) D
237) element
238) homogeneous
239) physical
240) chemical
241) 0 (zero)
242) 100
243) kinetic
244) 4.184 J
245) 0.0239 kcal
246) 1000
247) higher (2.6)
248) lower

249) cal/g °C or J/g °C
250) 450 cal
251) sublimation
252) evaporation
253) liquid
254) boiling or condensing
255) melting or freezing
256) solid
257) gas
258) TRUE
259) TRUE
260) TRUE
261) FALSE
262) TRUE
263) FALSE
264) TRUE
265) FALSE
266) FALSE
267) FALSE
268) TRUE
269) TRUE
270) FALSE
271) FALSE
272) TRUE
273) FALSE
274) TRUE
275) TRUE
276) FALSE
277) TRUE
278) TRUE
279) A
280) F
281) B
282) E
283) D
284) D
285) A
286) E
287) C
288) B
289) B
290) B
291) A
292) B
293) A
294) A
295) B
296) A
297) A
298) B