1a) scientific method
1b) a hypothesis
1c) a theory or scientific theory
1d) a natural law
1e) organic chemistry
1f) inorganic chemistry
1g) plants and animals
1h) matter (and it properties)

2a) a number, a unit, and an uncertainty
2b) m (for meter)
2c) tells the precision (or uncertainty) of a measurement or a value calculated from measurements
2d) a number obtained by counting
2e) false - weight depends on strength of gravity but mass does not.
2f) beaker, graduated cylinder, pipet, syringe, Erlenmeyer flask, volumetric flask, ...
2g) 1.02g
2h) 100g (the placeholder zeros are presumed not to be significant unless there is a decimal point)
2i) body temperature thermometer
2j) oven thermometer
2k) cannot tell from information given (need to evaluate the thermometer against a standard to tell accuracy)
2l) significant digits
2m) one (placeholder zeros are presumed not to be significant unless there is a decimal point)
2n) four
2o) one
2p) two
2q) +/−0.001mm
2r) +/−100g
2s) the rules of significant digits do not apply to exact or counted numbers. The number has zero uncertainty or infinite precision. Exact numbers do not affect the number of significant digits in a calculation.
2t) rounding
2u. false
2v) 9.99<u>6</u>7g/cm^3 has first nonsignificant digit is underlined. Round up to give 10.00g/cm^3
2w) The uncertainty of 3g measurement is the greatest (+/−1g), so report the answer to the nearest gram, 10.g (2 SD).
2x) The uncertainty of 0.1g measurement is the greatest (+/−0.1g), so report the answer to the nearest 0.1g, 9.9g (2 SD).
2y) Report the answer to 1SD because the measurement of 4cm^3 has 1SD. There are three ways to do this correctly: 1x10^{1}g/cm^3, 10 g/cm^3 (1SD), or 10 g/cm^3 +/−10 g/cm^3. An answer of 10g/cm^3 is wrong because you did not indicate the precision (uncertainty) of the answer. (The conservative rules of significant digits are needed because too many individuals make this mistake.)

2z) 123000000
2A) 0.0000000123
2B) 1.23×10^{5} (placeholder zeros presumed not to be significant)
2C) 1.2300×10^{-4} (the zeros after the 3 are not placeholders - they are significant digits)
2D) 27 oz (2SD) because measurement of 3.4 cups has 2SD and conversions within a measurement system are exact
2E) 1.5 days
2F) 6300 ft (2SD) because measurement of 1.2 miles has 2SD
2G) 100g +/− 10g or 2SD. 35% = 35g/(mass sample) *100%
2H) 65g. 35% = 35g/(35g + mass sample that is not nickel) *100%
2I) 69.6% (3SD) = 24.0g/(24.0g + 10.5g)*100%
2J) 35g. 35% = gNi/(gNi + 65) * 100%

3a) ns
3b) 3.55×10^{-10}km
3c) 3.2×10^{9}mm
3d) 2,21m
3e) 168lb
3f) 21m/s
3g) 80cm^3 +/−10cm^3 (or 1 SD or $8 \times 10^{1}\text{cm}^3$)
3h) $7.4 \times 10^{2}\text{cm}^3$
3i) 2.48mL
3j) 9.24g/mL
3k) 1.40×10^{2}g
3l) 0°C
3m) 212°F
3n) 25°C
3o) heat is the flow of energy from an object of higher temperature to one of lower temperature
3p) specific heat is the amount of heat needed to raise the temperature of 1g of substance by 1°C.

4) Research answers from book, online notes, or lecture notes.
4m) $C_4H_{10}O$
4n) 2 carbon atoms, 6 hydrogen atoms, 4 oxygen atoms