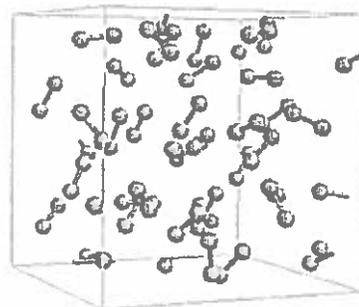


Multiple Choice [3 points each]. Choose the best answer and record it on your Scantron card.

1 Mark **both A and D** on your Scantron card. (This item is a form identifier and will not be scored.)

A 2 The sample pictured is best classified as:

- A an element.
- B a covalent/molecular compound.
- C an ionic compound.
- D a mixture.



B 3 The state or phase of the sample shown is best classified as:

- A solid.
- B liquid.
- C gas.
- D aqueous.

The next few questions refer to the following atoms or elements:

- A H
- B C
- C N
- D O
- E S

D 4 Which element has the highest electronegativity?

C 5 Which element has about the same electronegativity as Cl?

C 6 Which element's atoms typically form three bonds and a lone pair?

A 7 Which element can form both a +1 and a -1 ion?

B 8 Which element does not form monatomic ions?

D 9 Which statement below best describes a bond between N and O?

- A N and O form an ionic bond, with charges N^{3-} and O^{2-} .
- B N and O form an ionic bond, with charges N^{5+} and O^{2-} .
- C N and O form a covalent bond, in which both atoms have neutral charge.
- D N and O form a covalent bond, in which N has a $\delta+$ charge.
- E N and O form a covalent bond, in which O has a $\delta+$ charge.

A 10 Which option best describes the attraction between the C and H atoms in a single methane molecule?

- A covalent bond
- B ionic bond
- C dispersion forces
- D hydrogen bonding
- E both dispersion forces and hydrogen bonding

C 11 Which option best describes the attraction between two separate methane molecules?

- A covalent bond
- B ionic bond
- C dispersion forces
- D hydrogen bonding
- E both dispersion forces and hydrogen bonding

Check back over your exam and make sure you have completed all parts before turning in your paper!

D 12 Which of the following sets of values could apply to a substance that is a gas at room temperature?

	melting point	boiling point
A	-23 °C	77 °C
B	37 °C	150°C
C	77 °C	0 °C
D	-20 °C	0 °C
E	35 °C	150°C

C 13 Consider the same options from the previous question. Which set of melting and boiling point temperatures is actually impossible for any substance?

	melting point	boiling point
A	-23 °C	77 °C
B	37 °C	150°C
C	77 °C	0 °C
D	-20 °C	0 °C
E	35 °C	150°C

C 14 Which statement best describes what happens when $MgCl_2$ is mixed with water?

- A $MgCl_2$ is insoluble (does not dissolve).
- B $MgCl_2$ molecules disperse into the solution and mix with water molecules.
- C $MgCl_2$ dissociates into Mg^{2+} and Cl^- .
- D $MgCl_2$ dissociates into Mg and Cl_2 .
- E $MgCl_2$ dissociates into Mg^{2+} and Cl_2 .

B 15 Which of the following ionic compounds is likely to be soluble in water?

- A $BaSO_4$
- B K_3PO_4
- C $MgCO_3$
- D AgBr
- E FeS

B 16 The "amp" or ampere is a unit of electrical current (equivalent to one coulomb per second). A typical cell phone charger draws approximately 80 milliamps. What is this value in amps?

- A 0.000080 amps
- B 0.080 amps
- C 80 amps
- D 8000 amps
- E 80,000 amps

D **17 A solution is prepared by dissolving 2.31 g of sucrose in enough water to make 25.0 mL of solution. Calculate the percent concentration of this solution. (Problem 5.3 in text)

- A 0.0924 %
- B 0.578 %
- C 8.46 %
- D 9.24 %
- E 10.8 %

E **18 Intravenous sodium lactate contains 1.72 % (w/v) sodium lactate in water. If you have 100 mL of 5.00 % (w/v) sodium lactate, and you need to dilute it to 1.72 %, what must the final volume be? (Problem 5.63 in text)

- A 0.00344 mL
- B 2.91 mL
- C 8.6 mL
- D 34.4 mL
- E 291 mL

D 19 Convert 0.250 mol of NaOH into grams.

A 0.00625 g

B 0.250 g

C 1.00 g

D 10.0 g

E 40.0 g

The next few descriptions refer to the following substances. Choose the option that best fits each description:

A ethane

B 2-octene

C methanol, CH₃OH

D sodium hydroxide, NaOH

E more than one of these, or none of these

D 20 An ionic compound

C 21 A molecular compound with hydrogen bonding interactions between its molecules

C 22 An alcohol

C 23 An organic compound that is not a hydrocarbon

D 24 An electrolyte

D 25 A solid at room temperature

The next few questions refer to the following substances.

A propane

B ethanol, CH₃-CH₂-O-H

C pentane

D 1-hexanol, CH₃-CH₂-CH₂-CH₂-CH₂-CH₂-O-H

D 26 Which substance has the strongest dispersion forces?

D 27 Which substance has the highest boiling point?

B 28 Which substance is most soluble in water?

C 29 Which substance is an isomer of 2,2-dimethylpropane?

A 30 Which substance has the weakest total attractions?

A 31 Which substance is a gas at room temperature?

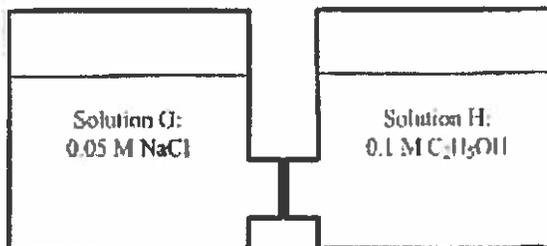
32 Skip the rest of the spaces on the front of your Scantron card. You will start the next section with Item #51 on the back of your Scantron card.

Turn your Scantron card over and answer the remaining questions starting with #51. The true-false questions on this page earn 1 point for each correct answer.

Consider the osmosis apparatus shown. Solution G is 0.05 M NaCl, and Solution H is 0.10 M ethanol, C_2H_5OH .

The two tanks containing solutions G and H are separated by a semipermeable membrane that allows both ions and molecular compounds to pass.

On your Scantron card, record whether each of the statements below is TRUE or FALSE as follows:



A TRUE B FALSE

- A 51 At the beginning of the experiment, osmosis does not occur.
- A 52 Sodium chloride dialyzes from Solution G to Solution H.
- A 53 Ethanol, C_2H_5OH , dialyzes from Solution H to Solution G.
- A 54 Over time, both solutions will come to have the same composition.
- B 55 As the experiment progresses, the level of the solution on the left will increase.
- A 56 At the start of the experiment, Solution G conducts electricity, but Solution H does not.