

Deep Run High School

CHEMISTRY I HON: 2(A), 6(A)

Unit 11 Test

Due Date: May 31, 2019

Instructor: Jennifer Krug

Name: _____

Score: / 100

Question 1

/1

Which of the following contains a **homogeneous mixture**?

- ☐ ice water
- ☐ oil and water
- ☐ sand
- ☐ air

Question 2

/1

Which of the following types of matter can be classified as a **homogeneous mixture**?

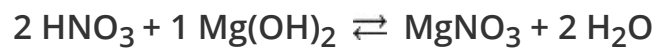
- ☐ muddy water
- ☐ bronze metal
- ☐ concrete
- ☐ sodium chloride

Name: _____

Question 3

/1

What is the molarity of a $\text{Mg}(\text{OH})_2$ solution if 23.9 mL is completely titrated by 15.3 mL of 0.500 M HNO_3 ?



☐ 0.320 M

☐ 0.160 M

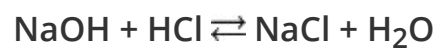
☐ 1.562 M

☐ 0.781 M

Question 4

/1

How many milliliters of 0.15 M NaOH are required to neutralize 20.0 ml of 0.30 M HCl?



☐ 40 ml

☐ 30 ml

☐ 20 ml

☐ 10 ml

Name: _____

Question 5

/1

Which of the following is an Arrhenius base?

- ☐ HCl
- ☐ NH₃
- ☐ NaCl
- ☐ NaOH

Question 6

/1

Which of the following statements is true?

- ☐ All Brønsted-Lowry acids and bases can be considered Arrhenius acids and bases.
- ☐ All acids and bases can be considered Arrhenius acids and bases.
- ☐ All Arrhenius acids and bases can be considered Brønsted-Lowry acids and bases.
- ☐ All acids and bases can be considered Brønsted-Lowry acids and bases.

Name: _____

Question 7

/1

What is the conjugate base of H_2O ?

☐ H_2O_2

☐ H_3O^{+1}

☐ O^{-2}

☐ OH^{-1}

Question 8

/1

To what volume should 30 mL of 2.5 M nitric acid be diluted to prepare a .50 M solution?

☐ 300 ml

☐ 60 ml

☐ 150 ml

☐ 75 ml

Name: _____

Question 9

/1

If 50.0 ml of a 1.5 M HCl solution is put into a flask and diluted with water to make 2.0 L of solution, what is the molarity of the final solution?

- ☐ 150 M
- ☐ 37.5 M
- ☐ 60 M
- ☐ 0.0375 M

Question 10

/1

Which solute will be most soluble in hexane?

- ☐ sodium chloride
- ☐ ammonia
- ☐ hydrochloric acid
- ☐ boron trichloride

Name: _____

Question 11

/1

If the solution is aqueous, the solvent is

- ☐ a base.
- ☐ an acid.
- ☐ water.
- ☐ ionic.

Question 12

/1

Which of the following shows the correct electrolytic dissociation for lithium hydroxide in water?

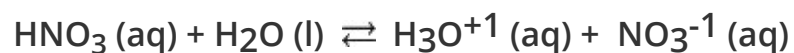
- ☐ $2 \text{LiOH (aq)} \rightleftharpoons 2 \text{Li}^{+1} \text{(aq)} + \text{H}_2\text{O (l)}$
- ☐ $\text{LiOH (s)} \rightleftharpoons \text{Li}^{+1} \text{(aq)} + \text{OH}^{-1} \text{(aq)}$
- ☐ $\text{Li(OH)}_2 \text{(aq)} \rightleftharpoons \text{Li}^{+1} \text{(aq)} + \text{H}_3\text{O}^{+1} \text{(aq)}$
- ☐ $\text{Li(OH)}_2 \text{(aq)} \rightleftharpoons \text{Li}^{+1} \text{(aq)} + 2 \text{OH}^{-1} \text{(aq)}$

Name: _____

Question 13

/1

Which of the following is the correct dissociation constant for nitric acid?



☐ $K_a = \frac{[\text{HNO}_3]}{[\text{H}_3\text{O}^{+1}] [\text{NO}_3^{-1}]}$

☐ $K_a = \frac{[\text{HNO}_3] [\text{H}_2\text{O}]}{[\text{H}_3\text{O}^{+1}] [\text{NO}_3^{-1}]}$

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Name: _____

Question 14

/1

If a solution has a hydrogen ion concentration of 1.0×10^{-3} M, what is the pOH of the solution?

☐

11

☐

3

☐

1

☐

7

Question 15

/1

What is the $[\text{OH}^{-1}]$ in a sample of lime juice with a pH of 2.0?

☐

1×10^{-7} M

☐

1×10^{-2} M

☐

1×10^{-12} M

☐

1×10^{-10} M

Name: _____

Question 16

/1

How many grams of NaNO_3 are needed to prepare 500.0 ml of a 1.50 M solution?

- ☐ 0.750 g
- ☐ 63800 g
- ☐ 39.8 g
- ☐ 63.8 g

Question 17

/1

A 0.67 L solution of ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, contains 0.81 mole of the solute. What is the approximate molarity of the solution?

- ☐ 0.83 M
- ☐ 1.2 M
- ☐ 1.5 M
- ☐ 0.54 M

Name: _____

Question 18

/1

What is the molarity of a solution that contains 28 grams KOH dissolved in 100 ml water?

- ☐ 0.28 M
- ☐ 5.0 M
- ☐ 280 M
- ☐ 0.005 M

Name: _____

Question 19

/1

A student used a conductivity apparatus to determine the electrolytic properties of several substances. Based on the data collected in a table, which substances are strong electrolytes.

Substances	Observations
HCl	Bright light
CH ₃ OH	No light
MgCl ₂	Faint light
NaOH	Bright light
CH ₃ COOH	Faint light
CCl ₄	No light

- ☐ HCl, MgCl₂, and CH₃COOH
- ☐ CH₃OH and CCl₄
- ☐ CCl₄, CH₃OH, NaOH
- ☐ NaOH and HCl

Name: _____

Question 20

/1

Which of the acids listed in the table is the weakest electrolyte?

Acid	Formula	Acid Dissociation Constant, K_a
Hydrofluoric acid	HF	6.8×10^{-4}
Hypochlorous acid	HClO	3.0×10^{-8}
Hydrocyanic acid	HCN	4.9×10^{-10}
Acetic acid	HC ₂ H ₃ O ₂	1.8×10^{-5}

- ☐ Hypochlorous acid
- ☐ Hydrofluoric acid
- ☐ Acetic acid
- ☐ Hydrocyanic acid

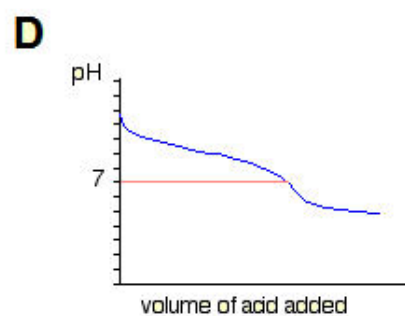
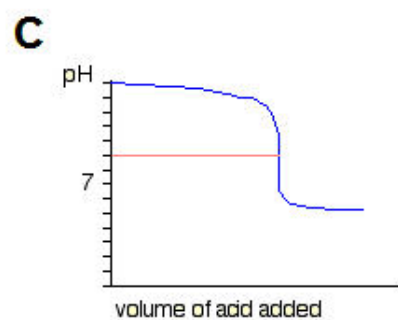
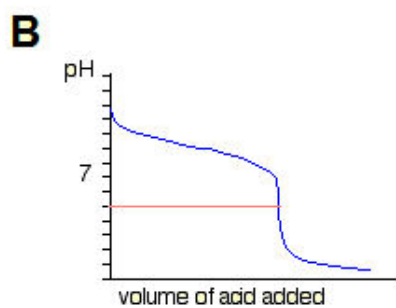
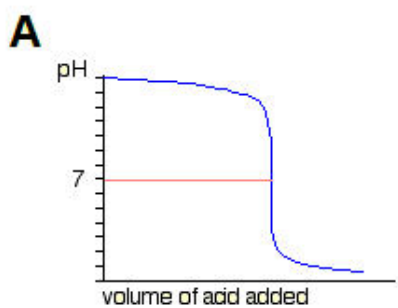
Question 25

/1

When blue litmus paper is dipped into an acidic solution, it will turn

- ☐ red.
- ☐ white.
- ☐ black.
- ☐ green.

Which of the following represents a titration curve for a strong acid and a weak base?



☐ A

☐ B

☐ C

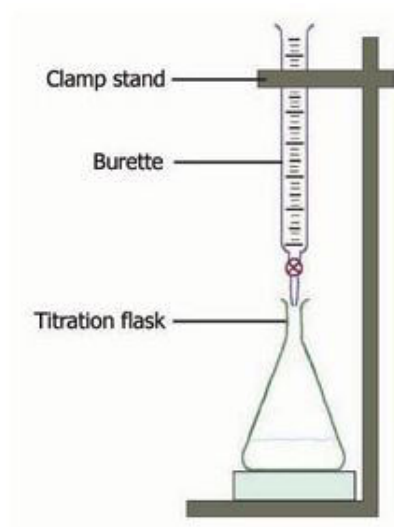
☐ D

Name: _____

Question 22

/1

The solution of unknown concentration, called the _____, is added to the titration flask.



- ☐ titrant
- ☐ analyte
- ☐ standard
- ☐ indicator

Name: _____

Question 23

/1

The $[\text{H}_3\text{O}^+]$ in a solution with a pH of 4.0 compared to the $[\text{H}_3\text{O}^+]$ in a solution with a pH of 6.0 is

- ☐ half as great.
- ☐ one-tenth as great.
- ☐ one hundred times as great.
- ☐ twice as great.

Question 24

/1

A 1.0 M aqueous solution of which substance would have the **lowest** pH?

- ☐ $\text{Ba}(\text{OH})_2$
- ☐ NaF
- ☐ HCl
- ☐ NH_3

Name: _____

Question 25

/1

When blue litmus paper is dipped into an acidic solution, it will turn

☐

red.

☐

white.

☐

black.

☐

green.

Instructions for grading: Grade each question and tally the score to obtain the total test points. If the factor does not equal 1, multiply the total points by the factor to obtain the student's final score.

Question 1

Which of the following contains a **homogeneous mixture**?

☐ air

1 possible pts.

Question 2

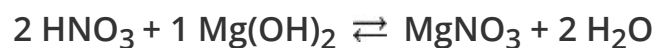
Which of the following types of matter can be classified as a **homogeneous mixture**?

☐ bronze metal

1 possible pts.

Question 3

What is the molarity of a $\text{Mg}(\text{OH})_2$ solution if 23.9 mL is completely titrated by 15.3 mL of 0.500 M HNO_3 ?

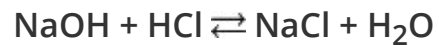


0.160 M

1 possible pts.

Question 4

How many milliliters of 0.15 M NaOH are required to neutralize 20.0 ml of 0.30 M HCl ?



40 ml

1 possible pts.

Question 5

Which of the following is an Arrhenius base?

☐ NaOH

1 possible pts.

Question 6

Which of the following statements is true?

☐ All Arrhenius acids and bases can be considered Brønsted-Lowry acids and bases.

1 possible pts.

Question 7

What is the conjugate base of H_2O ?

☐ OH^{-1}

1 possible pts.

Question 8

To what volume should 30 mL of 2.5 M nitric acid be diluted to prepare a .50 M solution?

☐ 150 ml

1 possible pts.

Question 9

If 50.0 ml of a 1.5 M HCl solution is put into a flask and diluted with water to make 2.0 L of solution, what is the molarity of the final solution?

☐ 0.0375 M

1 possible pts.

Question 10

Which solute will be most soluble in hexane?

☐ boron trichloride

1 possible pts.

Question 11

If the solution is aqueous, the solvent is

☐

water.

1 possible pts.

Question 12

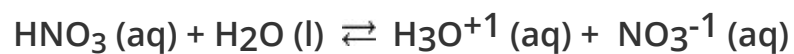
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☐

1 possible pts.

Question 13

Which of the following is the correct dissociation constant for nitric acid?



☐
$$K_a = \frac{[\text{H}_3\text{O}^{+1}] [\text{NO}_3^{-1}]}{[\text{HNO}_3]}$$

1 possible pts.

Question 14

If a solution has a hydrogen ion concentration of $1.0 \times 10^{-3} \text{ M}$, what is the pOH of the solution?

☐ 11

1 possible pts.

Question 15

What is the $[\text{OH}^{-1}]$ in a sample of lime juice with a pH of 2.0?

$1 \times 10^{-12} \text{ M}$

1 possible pts.

Question 16

How many grams of NaNO_3 are needed to prepare 500.0 ml of a 1.50 M solution?

63.8 g

1 possible pts.

Question 17

A 0.67 L solution of ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, contains 0.81 mole of the solute. What is the approximate molarity of the solution?

1.2 M

1 possible pts.

Question 18

What is the molarity of a solution that contains 28 grams KOH dissolved in 100 ml water?

5.0 M

1 possible pts.

Question 19

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CCl ₄	No light

NaOH and HCl

1 possible pts.

Question 20

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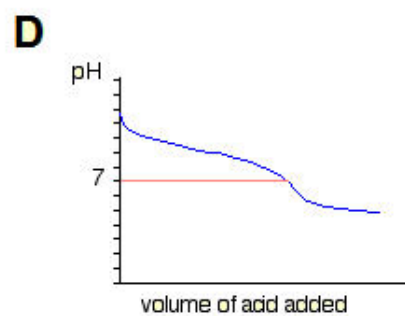
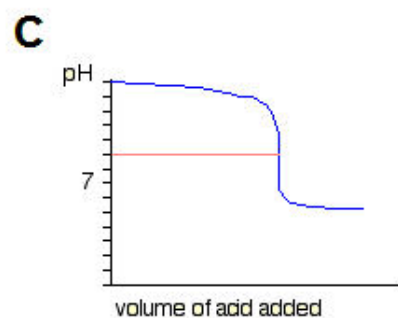
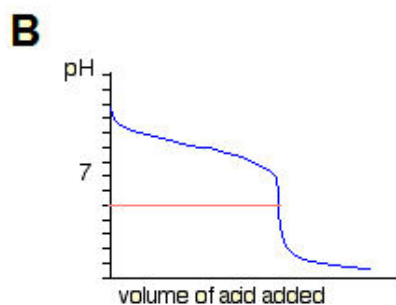
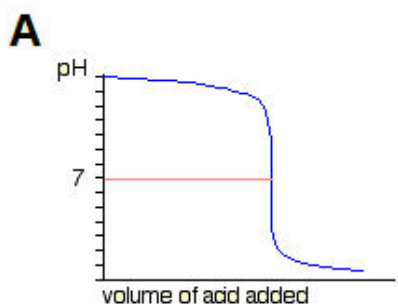
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Hydrocyanic acid	HCN	4.9×10^{-10}
Acetic acid	HC ₂ H ₃ O ₂	1.8×10^{-5}

☐ Hydrocyanic acid

1 possible pts.

Question 21

Which of the following represents a titration curve for a strong acid and a weak base?

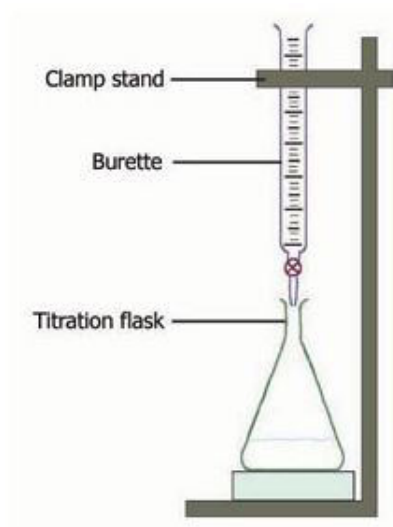


B

1 possible pts.

Question 22

The solution of unknown concentration, called the _____, is added to the titration flask.



analyte

1 possible pts.

Question 23

The $[\text{H}_3\text{O}^+]$ in a solution with a pH of 4.0 compared to the $[\text{H}_3\text{O}^+]$ in a solution with a pH of 6.0 is

☐ one hundred times as great.

1 possible pts.

Question 24

A 1.0 M aqueous solution of which substance would have the **lowest** pH?

☐ HCl

1 possible pts.

Question 25

When blue litmus paper is dipped into an acidic solution, it will turn

☐ red.

1 possible pts.