General Chemistry Multiple Choice Questions Chapter 12

1 Which of the following substances is an Arrhenius acid?

a HCl
b NaOH
c NH_3
d NH_2

	12.1

2 Which of the following substances is an Arrhenius base?

a NH_3
b H_2SO_4
c LiOH
d NH_2^-

	12.1

3 Which of the following substances is basic but NOT an Arrhenius base?

a NH_3
b LiOH
c HCl
d NaOH

	12.1

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1 Which of the following characterizes a solution of NH_4NO_3?

	12.2

a Acidic
b Basic
c Neutral
d Weak electrolyte

2 Which of the following reactions is between a Bronsted-Lowry acid and a Bronsted-Lowry base?

	12.2

a $2C_6H_6\ (l) + 15O_2\ (g) \text{---> } 12CO_2\ (g) + 6H_2O\ (l)$
b $C_2H_3O_2^-\ (aq) + H_3O^+\ (aq) \text{---> } HC_2H_3O_2\ (aq) + H_2O\ (l)$
c $CaCO_3\ (s) \text{---> } CaO\ (s) + CO_2\ (g)$
d $2H_2O_2\ (l) \text{---> } O_2\ (g) + 2H_2O\ (l)$
e $4H^+\ (aq) + 4Co^{2+}\ (aq) + O_2\ (g) + 24NH_3\ (aq) \text{---> } 4Co(NH_3)_6^{3+}\ (aq) + 2H_2O\ (l)$

3 Which of the following is defined as a proton (hydrogen-ion) donor?

	12.2

a Bronsted-Lowry Acid
b Bronsted-Lowry Base
c Arrhenius Acid
d Arrhenius Base

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1 Which of the following is NOT a strong acid?

a Hydrochloric Acid
b Hydrobromic Acid
c Hydrofluoric Acid
d Hydroiodic Acid

	12.3

2 Which of the following IS a strong acid?

a Nitric Acid
b Nitrous Acid
c Carbonic Acid
c Sulfurous Acid

	12.3

3 Which of the following is NOT a strong acid?

a Perchloric Acid
b Chloric Acid
c Hydrochloric Acid
d Nitric Acid

	12.3

4 Which of the following IS a strong acid?

a Hydroiodic Acid
b Boric Acid
c Carbonic Acid
d Phosphoric Acid

	12.3

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1 What are the conjugate acid and bases for the reaction of Nitric Acid and water?

a CA: NO_2 , CB: $H_3O^{\cdot}$

b CA: NO_3 , CB: $H_3O^{\cdot}$

c CA: NO_2^-, CB: H^+

d CA: NO_2^-, CB: H^+

	12.4

2 If the Bronsted-Lowry base is water, what is its conjugate acid?

a H_3O^+

b HOH^+

c H_2OH

d H^+

	12.4

3 If the Bronsted-Lowry acid is Acetic Acid, what is the conjugate base?

a $C_2H_3O_2$

b $HC_2H_3O_2$

c $C_2H_3O_2^-$

d $H_2C_2H_3O_2^+$

	12.4

General Chemistry Multiple Choice Questions Chapter 12

	12.5

1 When HBr is neutralized with KOH, what salt is produced?

a H_2O

b KH

c KBr

d K_2O

	12.5

2 When the following is completed and balanced, the products of the reaction below are
$Al(OH)_3$ *(s)* + H_2SO_4 *(aq)*

a $AlSO_4$ *(aq)* + $6H_2O$ *(l)*

b $Al_2(SO_4)_3$ *(aq)* + $6H_2O$ *(l)*

c $AlSO_4$ *(s)* + H_2O *(l)*

d $Al_2(SO_4)_3$ *(aq)* + H_2O *(l)*

	12.5

3 What is the salt created by the neutralization of phosphoric acid and lithium hydroxide?

a Li_3P

b $LiPO_4$

c $Li(PO_4)_3$

d Li_3PO_4

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1 What is the pH of a 0.25 M HBr solution?

a -0.25 **b** 0.25

c -0.60 **d** 0.6

	12.6

2 What is the pH of a 0.030 M $Ba(OH)_2$ solution?

a 1.22 **b** 12.78

c 1.52 **d** 12.48

	12.6

3 The pH of a HCl solution is 2.87. What is $[H^+]$?

a 0.46 M **b** 5.67×10^{-2} M

c 1.35×10^{-3} M **d** 17.63 M

	12.6

4 Which of the following does not describe an acidic solution?

a pH = 5 **b** pH = 1

c $[H^+] = 1.3 \times 10^{-3}$ M **d** $[H^+] = 3 \times 10^{-9}$ M

	12.6

5 When 200. mL of 2.0 M NaOH (aq) is added to 500. mL of 1.0 M HCl (aq), the pH of the resulting mixture is

a 1 **b** 3

c 7 **d** 13

	12.6

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	12.7

1 What is the pH of a 0.200 M phenol ($k_a = 1.3 \times 10^{-10}$) solution?

a 3.87 **b** 4.15

c 4.36 **d** 5.29

	12.7

2 K_b for trimethylamine ($(CH_3)_3N$), a weak base, is 7.4×10^{-5}. What is $[OH^-]$ in a 0.0450M trimethylamine soln

a 3.3×10^{-6} M **b** 1.8×10^{-3} M

c 1.2×10^{-3} M **d** 2.6×10^{-2} M

	12.7

3 What is the pH of a 0.010 M NaC_3H_7COO (sodium propionate) solution? $K_a = 1.4 \times 10^{-5}$ for the weak acid

a 3.42 **b** 5.57

c 8.43 **d** 10.27

	12.7

4 A 0.10 M solution of a weak monoprotic acid has a pH of 4.0. The ionization constant, K_a of the acid is

a 1×10^{-3} **b** 1×10^{-4}

c 1×10^{-7} **d** 1×10^{-8}

e 1×10^{-9}

General Chemistry Multiple Choice Questions Chapter 12

1 Which of the following indicators turns yellow in basic solution?

a Bromophenol Blue
b Methyl Red
c Phenol Red
d Bromothymol Blue

	12.8

2 Which of the following indicators has a pH range of approximately 3.0 to 4.6?

a Phenol Red
b Methyl Red
c Phenolthphalein
d Bromophenol Blue

	12.8

3 Which of the following indicators has a pH range nearest to distilled water?

a Phenol Red
b Bromophenol Blue
c Methyl Red
d Methyl Orange

	12.8