1. chem10b 16.1-27

The pH of a 0.10 M solution of a weak base is 9.82. What is the K_b for this base?

Student Response	Correct Answer
A. 8.8×10^{-8}	
B. 2.1×10^{-4}	
C. 6.6×10^{-4}	
D. 2.0×10^{-5}	
E. 4.3×10^{-8}	

2. chem10b 16.1-1

What is the conjugate acid of NH_3?

Student Response	Correct Answer
A. NH_4^+	
B. NH_2^+	
C. NH_3	
D. NH_4OH	
E. NH_3^+	

3. chem10b 16.4-3

The simplest amino acid is glycine.

Student Response	Value	Correct Answer

4. chem10b 16.2-27

Using the data in the table, which of the conjugate bases below is the strongest base?

Student Response	Correct Answer
A. ClO^-	
B. F^-	
C. CHO_2^-	
D. OAc^-	
E. OAc^- and CHO_2^-	

5. chem10b 16.1-18

A 0.15 M aqueous solution of the weak acid HA at 25.0 °C has a pH of 5.35. The value of K_a for HA is _____.

Student Response	Correct Answer
A. 1.8×10^{-5}	
B. 1.4×10^{-10}	
C. 3.3×10^{4}	
D. 3.0×10^{-5}	
E. 7.1×10^{-9}	

6. chem10b 16.1-35

Calculate the pOH of a 0.0827 M aqueous sodium cyanide solution at 25.0 °C. K_b for CN^- is

Student Response	Correct Answer
A. 8.8	
B. 10	
C. 5.2	

D. 9.3
E. 1.1

7. chem10b 16.1-4

What is the conjugate base of OH^-?

Student Response	Correct Answer
A. H_3O^+	
B. H_2O	
C. O_2	
D. O^-	
E. O^{2-}	

8. chem10b 16.1-29

Determine the pH of a 0.35 M aqueous solution of CH_3NH_2 (methylamine). The K_b of methylamine is 4.4×10^{-4}.

Student Response	Correct Answer
A. 1.9	
B. 10	
C. 13	
D. 12	
E. 3.8	

9. chem10b 16.5-7

The acid-dissociation constant of hydrocyanic acid (HCN) at 25.0 °C is 4.9×10^{-10}. What is the pH of an aqueous solution of 0.080 M sodium cyanide (NaCN)?

Student Response	Correct Answer
A. 1.3×10^{-3}	
B. 11.11	

C. 7.8×10^{-12}
D. 2.89
E. 3.9×10^{-11}

10. chem10b 16.1-42

The pH of a 0.15 M aqueous solution of NaZ (the sodium salt of HZ) is 10.7. What is the K_a for HZ?

Student Response	Correct Answer
A. 3.3×10^{-8}	
B. 1.6×10^{-6}	
C. 8.9×10^{-4}	
D. 6.0×10^{-9}	
E. 1.3×10^{-12}	

11. chem10b 16.1-26

The acid-dissociation constant for chlorous acid, $HClO_2$, at 25.0 °C is 1.0×10^{-2}. Calculate the concentration of H^+ if the initial concentration of acid is 0.10 M.

Student Response	Correct Answer
A. 2.7×10^{-2}	
B. 3.7×10^{-2}	
C. 3.2×10^{-2}	
D. 1.0×10^{-2}	
E. 1.0×10^{-3}	

12. chem10b 16.1-36

Determine the pH of a 0.15 M aqueous solution of KF. For hydrofluoric acid,

Student Response	Correct Answer

A. 8.2
B. 2.3
C. 5.8
D. 12
E. 6.6

13. chem10b 16.1-13

What is the pH of a 0.0150 M aqueous solution of barium hydroxide?

Student Response	Correct Answer
A. 12.2	
B. 1.52	
C. 12.5	
D. 10.4	
E. 1.82	

14. chem10b 16.1-8

What is the pH of an aqueous solution at 25.0 °C that contains 3.98×10^{-9} M hydroxide ion?

Student Response	Correct Answer
A. 9.00	
B. 8.40	
C. 5.60	
D. 3.98	
E. 7.00	

15. chem10b 16.1-2

The conjugate base of HSO_4^- is

Student Response	Correct Answer

A. HSO_4^+
B. $H_3SO_4^+$
C. OH^-
D. SO_4^{2-}
E. H_2SO_4

16. chem10b 16.2-28

Which of the following ions will act as a weak base in water?

Student Response	Correct Answer
A. Cl^-	
B. NO_3^-	
C. OH^-	
D. ClO^-	
E. None of the above will act as a weak base in water.	

17. chem10b 16.2-34

A 0.1 M solution of _____ has a pH of 7.0.

Student Response	Correct Answer
A. $NaNO_3$	
B. KF	
C. Na_2S	
D. NaF	
E. NH_4Cl	

18. chem10b 16.1-11

Calculate the pOH of a solution at 25.0 °C that contains 1.94×10^{-10} M hydronium ions.

Student Response	Correct Answer

A. 1.94
B. 4.29
C. 14.0
D. 7.00
E. 9.71

19. chem10b 16.2-8

The concentration of water in pure water is approximately _____ M.

Student Response	Correct Answer
A. 18	
B. 55	
C. 83	
D. 0.100	
E. 100	

20. chem10b 16.2-9

In basic solution, _____.

Student Response	Correct Answer
A. $[H_3O^+] < [OH^-]$	
B. $[OH^-] > 7.00$	
C. $[H_3O^+] = 0$ M	
D. $[H_3O^+] = [OH^-]$	
E. $[H_3O^+] > [OH^-]$	

1. chem10b 16.2-34

A 0.1 M solution of _____ has a pH of 7.0.

Student Response	Correct Answer
A. NH_4Cl	
B. Na_2S	
C. NaF	
D. $NaNO_3$	
E. KF	

Score: 1/1

2. chem10b 16.5-5

The acid-dissociation constant at 25.0 °C for hypochlorous acid (HClO) is 3.0×10^{-8}. At equilibrium, the molarity of H_3O^+ in a 0.010 M solution of HClO is _____.

Student Response	Correct Answer
A. 5.8×10^{-10}	
B. 4.76	
C. 2.00	
D. 0.010	
E. 1.7×10^{-5}	

Score: 1/1

3. chem10b 16.2-9

In basic solution, _____.

Student Response	Correct Answer
A. $[H_3O^+] = [OH^-]$	
B. $[H_3O^+] < [OH^-]$	
C. $[H_3O^+] = 0$ M	
D. $[OH^-] > 7.00$	
E. $[H_3O^+] > [OH^-]$	

4. chem10b 16.1-33

The K_a for HCN is 4.9×10^{-10}. What is the value of K_b for CN^-?

Student Response	Correct Answer
A. 4.0×10^{-6}	
B. 2.0×10^{9}	
C. 4.9×10^{4}	
D. 4.9×10^{-24}	
E. 2.0×10^{-5}	

5. chem10b 16.2-13

An aqueous solution contains 0.10 M NaOH. The solution is _____.

Student Response	Correct Answer
A. very dilute	
B. acidic	
C. highly colored	
D. basic	
E. neutral	

6. chem10b 16.1-37

Calculate the pH of 0.726 M anilinium hydrochloride ($C_6H_5NH_3Cl$) solution in water, given that K_b for aniline is 3.83×10^{-4}.

Student Response	Correct Answer
A. 12.2	
B. 5.36	
C. 8.64	
D. 12.4	
E. 1.77	

7. chem10b 16.1-16

HZ is a weak acid. An aqueous solution of HZ is prepared by dissolving 0.020 mol of HZ in sufficient water to yield 1.0 L of solution. The pH of the solution was 4.93 at 25.0 °C. The K_a of HZ is _____.

Student Response	Correct Answer
A. 2.8×10^{-12}	
B. 9.9×10^{-2}	
C. 1.4×10^{-10}	
D. 6.9×10^{-9}	
E. 1.2×10^{-5}	

8. chem10b 16.2-23

Classify the following compounds as weak acids (W) or strong acids (S):

hypochlorous acid perchloric acid chloric acid

Student Response	Correct Answer
A. W S S	
B. W W W	
C. W S W	
D. S S S	
E. S W W	

9. chem10b 16.4-4

When the proton in the COOH group in an amino acid is transferred to the NH_2 group of that same amino acid molecule, a zwitterion is formed.

Student Response	Value	Correct Answer

10. chem10b 16.1-6

What is the pH of an aqueous solution at 25.0 °C in which $[OH^-]$ is 0.00250 M?

Student Response	Correct Answer
A. +2.60	

B. -2.60
C. +11.4
D. -11.4
E. -2.25

11. chem10b 16.1-32

The base-dissociation constant, K_b, for pyridine, C_5H_5N, is The acid-dissociation constant, K_a, for the pyridinium ion, is _____.

Student Response	Correct Answer
A. 1.4×10^{-23}	
B. 1.4×10^{-5}	
C. 1.0×10^{-7}	
D. 7.1×10^{-6}	
E. 7.1×10^{-4}	

Score: 1/1

12. chem10b 16.1-39

The K_a for formic acid (HCO_2H) is 1.8×10^{-4}. What is the pH of a 0.35 M aqueous solution of sodium formate ($NaHCO_2$)?

Student Response	Correct Answer
A. 4.2	
B. 11	
C. 8.6	
D. 3.3	
E. 5.4	

1. chem10b 16.2-20

Which one of the following is a Br nsted-Lowry acid?

Student Response	Correct Answer
A. CH_3COOH	
B. HNO_2	
C. $(CH_3)_3NH^+$	
D. HF	
E. all of the above	

2. chem10b 16.1-14

What is the pOH of a 0.0150 M solution of barium hydroxide?

Student Response	Correct Answer
A. 1.52	
B. 12.5	
C. 12.2	
D. 1.82	
E. 10.4	

3. chem10b 16.4-2

In the reaction

$BF_3 + F^- \rightarrow BF_4^-$

BF_3 acts as a Br nsted-Lowry acid.

Student Response	Value	Correct Answer

4. chem10b 16.1-3

The conjugate acid of HSO_4^- is

Student Response	Correct Answer
A. SO_4^{2-}	
B. HSO_4^+	
C. H_2SO_4	
D. HSO_3^+	
E. H^+	

5. chem10b 16.1-1

What is the conjugate acid of NH_3?

Student Response	Correct Answer
A. NH_2^+	
B. NH_3	
C. NH_3^+	
D. NH_4OH	
E. NH_4^+	

6. chem10b 16.2-14

Nitric acid is a strong acid. This means that _____.

Student Response	Correct Answer
A. HNO_3 does not dissociate at all when it is dissolved in water	
B. HNO_3 produces a gaseous product when it is neutralized	
C. HNO_3 dissociates completely to $H^+(aq)$ and $NO_3^-(aq)$ when it dissolves in water	
D. aqueous solutions of HNO_3 contain equal concentrations of $H^+(aq)$ and $OH^-(aq)$	
E. HNO_3 cannot be neutralized by a weak base	

7. chem10b 16.2-19

The K_a of hypochlorous acid (HClO) is 3.0×10^{-8} at 25 C. What is the % ionization of hypochlorous acid in a aqueous solution of HClO at 25 C

Student Response	Correct Answer
A. 1.4×10^{-3}	
B. 4.5×10^{-8}	
C. 0.14	
D. 14	
E. 2.1×10^{-5}	

8. chem10b 16.2-10

Which solution below has the highest concentration of hydroxide ions?

Student Response	Correct Answer
A. pH = 7.00	
B. pH = 7.93	
C. pH = 3.21	
D. pH = 12.6	
E. pH = 9.82	

Score: 1/1

9. chem10b 16.1-39

The K_a for formic acid (HCO_2H) is 1.8×10^{-4}. What is the pH of a 0.35 M aqueous solution of sodium formate ($NaHCO_2$)?

Student Response	Correct Answer
A. 5.4	
B. 11	
C. 3.3	
D. 4.2	
E. 8.6	

10. chem10b 16.2-17

Which one of the following is the weakest acid?

Student Response	Correct Answer
A. HClO ($K_a = 3.0 \times 10^{-8}$)	
B. HNO_2 ($K_a = 4.5 \times 10^{-4}$)	
C. HF ($K_a = 6.8 \times 10^{-4}$)	
D. Acetic acid ($K_a = 1.8 \times 10^{-5}$)	
E. HCN ($K_a = 4.9 \times 10^{-10}$)	

11. chem10b 16.1-23

The acid-dissociation constants of sulfurous acid (H_2SO_3) are and at 25.0 °C. Calculate the pH of a 0.163 M aqueous solution of sulfurous acid.

Student Response	Correct Answer
A. 1.8	
B. 7.2	
C. 4.5	
D. 1.3	
E. 1.4	

12. chem10b 16.1-7

What is the pH of an aqueous solution at 25.0 °C that contains 3.98×10^{-9} M hydronium ion?

Student Response	Correct Answer
A. 3.98	
B. 9.00	
C. 5.60	
D. 8.40	
E. 7.00	

1. chem10b 16.1-15

An aqueous solution contains 0.100 M NaOH at 25.0 °C. The pH of the solution is _____.

Student Response	Correct Answer
A. 0.100	
B. 1.00	
C. 13.0	
D. 7.00	
E. -1.00	

2. chem10b 16.2-12

The hydride ion, H^-, is a stronger base than the hydroxide ion, OH^-. The product(s) of the reaction of hydride ion with water is/ are _____.

Student Response	Correct Answer
A. H_2O_2 (aq)	
B. no reaction occurs	
C. OH^- (aq) + H_2 (g)	
D. OH^- (aq) + $2H^+$ (aq)	
E. H_3O^+ (aq)	

Score: 1/1

3. chem10b 16.1-34

K_a for HF is 7.0×10^{-4}. K_b for the fluoride ion is _____.

Student Response	Correct Answer
A. 1.4×10^{-11}	
B. 7.0×10^{-4}	
C. 2.0×10^{-8}	

D. 1.4×10^{3}
E. 7.0×10^{-18}

4. chem10b 16.5-3

Calculate the molarity of hydroxide ion in an aqueous solution that has a pOH of 5.33.

Student Response	Correct Answer
A. 4.7×10^{-6}	
B. 8.7×10^{-14}	
C. 2.1×10^{-9}	
D. 5.3×10^{-14}	
E. 8.67	

5. chem10b 16.1-14

What is the pOH of a 0.0150 M solution of barium hydroxide?

Student Response	Correct Answer
A. 12.2	
B. 1.82	
C. 10.4	
D. 12.5	
E. 1.52	

Score: 1/1

6. chem10b 16.1-16

HZ is a weak acid. An aqueous solution of HZ is prepared by dissolving 0.020 mol of HZ in sufficient water to yield 1.0 L of solution. The pH of the solution was 4.93 at 25.0 °C. The K_a of HZ is _____.

Student Response	Correct Answer
A. 6.9×10^{-9}	
B. 9.9×10^{-2}	

C. 1.2×10^{-5}
D. 2.8×10^{-12}
E. 1.4×10^{-10}

7. chem10b 16.2-13

An aqueous solution contains 0.10 M NaOH. The solution is _____.

Student Response	Correct Answer
A. neutral	
B. very dilute	
C. highly colored	
D. basic	
E. acidic	

8. chem10b 16.2-34

A 0.1 M solution of _____ has a pH of 7.0.

Student Response	Correct Answer
A. $NaNO_3$	
B. NH_4Cl	
C. Na_2S	
D. NaF	
E. KF	

9. chem10b 16.1-25

The acid-dissociation constants of phosphoric acid (H_3PO_4) are $K_{a1} = 7.5 \times 10^{-3}$, and

at What is the molar concentration of phosphate ion in a 2.5 M aqueous solution of phosphoric acid?

Student Response	Correct Answer
A. 8.2×10^{-9}	
B. 0.13	
C. 2.5×10^{-5}	
D. 9.1×10^{-5}	
E. 2.0×10^{-19}	

Score: 1/1

10. chem10b 16.1-9

What is the concentration (in M) of hydronium ions in a solution at 25.0 °C with pH = 4.282?

Student Response	Correct Answer
A. 4.28	
B. 1.66×10^{4}	
C. 1.92×10^{-10}	
D. 5.22×10^{-5}	
E. 9.71	

11. chem10b 16.1-23

The acid-dissociation constants of sulfurous acid (H_2SO_3) are 0.017 and 6.4x10^-8 at 25.0 °C. Calculate the pH of a 0.163 M aqueous solution of sulfurous acid.

Student Response	Correct Answer
A. 1.3	
B. 4.5	
C. 1.4	
D. 7.2	
E. 1.8	

12. chem10b 16.1-18

A 0.15 M aqueous solution of the weak acid HA at 25.0 °C has a pH of 5.35. The value of K_a for HA is _____.

Student Response	Correct Answer
A. 1.4×10^{-10}	
B. 3.3×10^{4}	
C. 3.0×10^{-5}	
D. 1.8×10^{-5}	
E. 7.1×10^{-9}	

1. chem10b 16.1-35

Calculate the pOH of a 0.0827 M aqueous sodium cyanide solution at 25.0 °C. K_b for CN^- is 4.9x10^-10.

Student Response	Correct Answer
A. 8.8	
B. 9.3	
C. 1.1	
D. 5.2	
E. 10	

2. chem10b 16.1-11

Calculate the pOH of a solution at 25.0 °C that contains 1.94×10^{-10} M hydronium ions.

Student Response	Correct Answer
A. 4.29	
B. 1.94	
C. 9.71	
D. 14.0	
E. 7.00	

3. chem10b 16.2-5

The molar concentration of hydronium ion in pure water at 25°C is _____.

Student Response	Correct Answer
A. 7.00	
B. 0.00	
C. 1.00	
D. 1.0×10^{-14}	
E. 1.0×10^{-7}	

4. chem10b 16.4-1

An acid containing the COOH group is called a carbo-oxy acid.

Student Response	Value	Correct Answer

5. chem10b 16.1-17

The pH of a 0.55 M aqueous solution of hypobromous acid, HBrO, at 25.0 °C is 4.48. What is the value of K_a for HBrO?

Student Response	Correct Answer
A. 1.1×10^{-9}	
B. 2.0×10^{-9}	
C. 3.3×10^{-5}	
D. 6.0×10^{-5}	
E. 3.0×10^{4}	

6. chem10b 16.1-34

K_a for HF is 7.0×10^{-4}. K_b for the fluoride ion is _____.

Student Response	Correct Answer

A. 1.4×10^{-11}
B. 1.4×10^{3}
C. 7.0×10^{-18}
D. 2.0×10^{-8}
E. 7.0×10^{-4}

7. chem10b 16.2-27

Using the data in the table, which of the conjugate bases below is the strongest base?

Student Response	Correct Answer
A. ClO^-	
B. F^-	
C. CHO_2^-	
D. OAc^-	
E. OAc^- and CHO_2^-	

8. chem10b 16.2-10

Which solution below has the highest concentration of hydroxide ions?

Student Response	Correct Answer
A. pH = 9.82	
B. pH = 3.21	
C. pH = 7.93	
D. pH = 12.6	
E. pH = 7.00	

9. chem10b 16.2-17

Which one of the following is the weakest acid?

Student Response	Correct Answer
A. HCN ($K_a = 4.9 \times 10^{-10}$)	
B. HF ($K_a = 6.8 \times 10^{-4}$)	
C. HClO ($K_a = 3.0 \times 10^{-8}$)	
D. HNO_2 ($K_a = 4.5 \times 10^{-4}$)	
E. Acetic acid ($K_a = 1.8 \times 10^{-5}$)	

10. chem10b 16.2-3

A Bronsted-Lowry acid is defined as a substance that _____.

Student Response	Correct Answer
A. increases [OH^-] when placed in H_2O	
B. increases [H^+] when placed in H_2O	
C. acts as a proton donor	
D. acts as a proton acceptor	
E. decreases [H^+] when placed in H_2O	

11. chem10b 16.1-22

The K_a of hydrazoic acid (HN_3) is 1.9×10^{-5} at 25.0 °C. What is the pH of a 0.35 M aqueous solution of HN3?

Student Response	Correct Answer
A. 2.4	
B. 11	
C. -2.4	
D. 2.6	
E. 5.2	

12. chem10b 16.2-22

Classify the following compounds as weak acids (W) or strong acids (S):

nitrous acid hydrochloric acid hydrofluoric acid

Student Response	Correct Answer
A. S S S	
B. S W W	
C. W S W	
D. W S S	
E. W W W	