

What is the hydronium ion concentration of a 0.010 M solution of acetic acid?

$K_a$  for acetic acid is  $1.8 \times 10^{-5}$

$1.8 \times 10^{-3}$  .a ☐

✓  $4.2 \times 10^{-4}$  .b ☒

$1.8 \times 10^{-5}$  .c ☐

$1.0 \times 10^{-2}$  .d ☐

الإجابة الصحيحة هي:

$4.2 \times 10^{-4}$

**When more and more water is diluted with acids its  $H^+$  ion concentration will**

- ☒ a. decrease
- ☐ b. remains the same
- ☐ c. depends on the type of acids
- ☐ d. increase

الإجابة الصحيحة هي:

decrease

Out of the chloric acid ( $\text{HClO}_3$ ) and perchloric acid ( $\text{HClO}_4$ ),  $\text{HClO}_4$  is more stable.

State whether the above statement is true or false.

False .a ☐

✓ True .b ☒

الإجابة الصحيحة هي:

True

The pH of a solution is 4.80. What is the concentration of hydroxide ions in this solution?

✓ ☒ a.  $6.3 \times 10^{-10} \text{ M}$

☐ b.  $3.6 \times 10^{-12} \text{ M}$

☐ c.  $1.6 \times 10^{-5} \text{ M}$

☐ d.  $4.2 \times 10^{-9} \text{ M}$

الإجابة الصحيحة هي:

$6.3 \times 10^{-10} \text{ M}$

Percent ionization increases with  
.decreasing  $K_a$

✓ False .a ☒

True .b ☐

الإجابة الصحيحة هي:

False

سؤال 6

صحيح

درجة 2.00 من 2.00

علم هذا السؤال

50 ml of 0.05 M  $\text{HNO}_3$  is added to 50 ml of 0.025 M  $\text{KOH}$ . Calculate the pH of the resultant solution.

1.309 .a ☐

✓ 1.903 .b ☒

$1.25 \times 10^{-3}$  .c ☐

1.75 .d ☐

الإجابة الصحيحة هي:

1.903

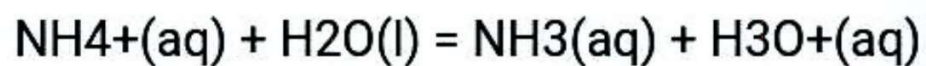
سؤال 4

صحيح

درجة 2.00 من 2.00

علم هذا السؤال

What is the concentration of ammonium chloride in a solution if its pH is 4.80?  $K_a = K_w/K_b$ ,  $K_b$  for  $\text{NH}_3 = 1.8 \times 10^{-5}$



0.30 M .a ☐

0.60 M .b ☐

✓ 0.45 M .c ☒

0.25 M .d ☐

الإجابة الصحيحة هي:

0.45 M

In the following reaction in aqueous solution, the acid reactant is \_\_\_\_\_, and \_\_\_\_\_ its conjugate base product is



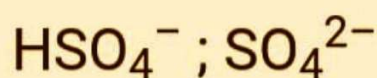
CH<sub>3</sub>NH<sub>2</sub>; SO<sub>4</sub><sup>2-</sup> .a ☐

CH<sub>3</sub>NH<sub>2</sub>; CH<sub>3</sub>NH<sub>3</sub><sup>+</sup> .b ☐

HSO<sub>4</sub><sup>-</sup> ; CH<sub>3</sub>NH<sub>3</sub><sup>+</sup> .c ☐

✓ HSO<sub>4</sub><sup>-</sup> ; SO<sub>4</sub><sup>2-</sup> .d ☒

الإجابة الصحيحة هي:



What is the pH of 1mM concentrated sulfuric acid?

2.75 .a ☐

1.03 .b ☐

✖ 3.01 .c ☒

2.00 .d ☐

الإجابة الصحيحة هي:

2.75

**When more and more water is diluted with acids its  $H^+$  ion concentration will**

- a ☐ remains the same
- b ☒ decrease
- c ☐ depends on the type of acids
- d ☐ increase

الإجابة الصحيحة هي:

decrease

سؤال 8

صحيح

درجة 1.00 من 1.00

٣ علّم هذا السؤال

\_\_\_\_\_, The stronger the acid

- a. ☐ the less concentrated the conjugate base.
- b. ☐ the stronger its conjugate base.
- c. ☒ the weaker its conjugate base.
- d. ☐ the more concentrated the acid

الإجابة الصحيحة هي:

the weaker its conjugate base.

إنهاء المراجعة

تنقل الاختبار



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?The pH of a solution is 4.80. What is the concentration of hydroxide ions in this solution

- 1.6 x 10<sup>-5</sup> M .a ☐
- ✓ 6.3 x 10<sup>-10</sup> M .b ☒
- 4.2 x 10<sup>-9</sup> M .c ☐
- 3.6 x 10<sup>-12</sup> M .d ☐

الإجابة الصحيحة هي:

6.3 x 10<sup>-10</sup> M

How would you calculate  $K_b$  for the formate ion, given that the  $K_a$  for formic acid is  $1.8 \times 10^{-4}$ ?  
( $K_w = 1.0 \times 10^{-14}$ )

$K_b = K_a \times K_w$  .a ☐

✓  $K_b = K_w / K_a$  .b ☒

$K_b = K_a / K_w$  .c ☐

$K_b = K_w + K_a$  .d ☐

الإجابة الصحيحة هي:

$K_b = K_w / K_a$

سؤال 6

صحيح

درجة 2.00 من 2.00

علم هذا السؤال

The pOH of a solution of NaOH is 11.30.  
?What is the  $[H^+]$  for this solution

✓  $2.0 \times 10^{-3}$  .a ☒

$5.0 \times 10^{-12}$  .b ☐

$4.0 \times 10^{-12}$  .c ☐

$2.5 \times 10^{-3}$  .d ☐

الإجابة الصحيحة هي:

$2.0 \times 10^{-3}$

Percent ionization increases with decreasing  
Ka.

a. False

b. True

الإجابة الصحيحة هي:

False

:An electron pair acceptor is

.a Arrhenius acid

.b Bronsted-Lowry acid

.c Lewis acid

.d Bronsted-Lowry base

الإجابة الصحيحة هي:

Lewis acid

Out of the chloric acid ( $\text{HClO}_3$ ) and perchloric acid ( $\text{HClO}_4$ ),  $\text{HClO}_4$  is more stable  
State whether the above statement is true or false.

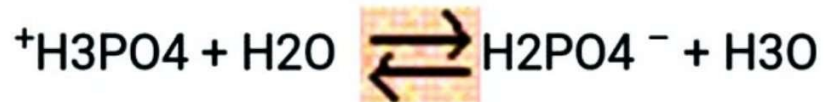
True .a

False .b

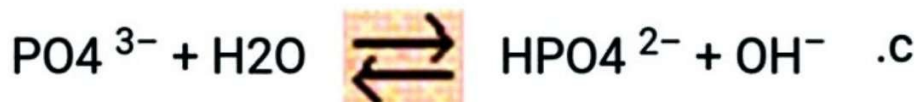
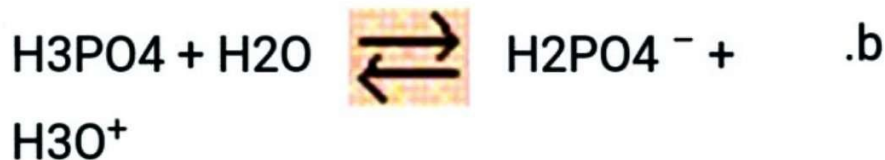
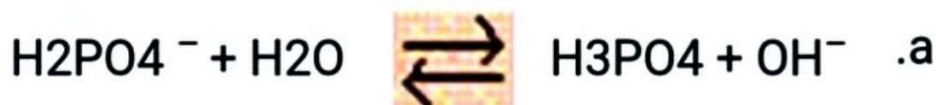
الإجابة الصحيحة هي:

True

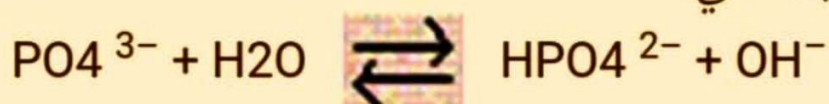
Phosphoric acid is a triprotic acid, ionizing in the following sequential steps



Which equilibrium is most important in determining the pH of a solution of sodium phosphate?



الإجابة الصحيحة هي:



Ammonia ( $\text{NH}_3$ ) acts as a weak base in aqueous solution. What is the acid that reacts with this base when ammonia is dissolved in water

a.  $\text{H}_2\text{O}$

b. none, there are no acids in pure water

c.  $\text{NH}_4^+$

d. oxygen that always is dissolved in water

الإجابة الصحيحة هي:

$\text{H}_2\text{O}$

What is the pH of a 0.15 M solution of weak acid ammonium bromide? The  $K_b$  value for ammonia is  $1.8 \times 10^{-5}$ .

a. 5.04

b. 7.00

c. 11.22

d. 2.78

الإجابة الصحيحة هي:

5.04

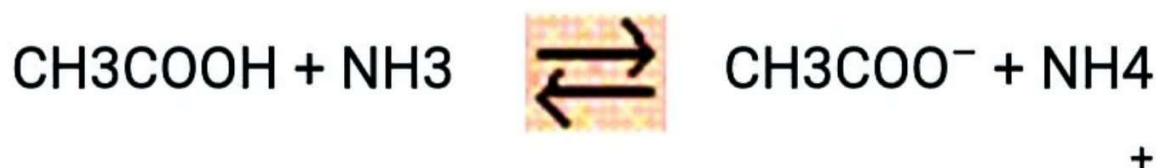
What is the hydronium ion concentration of a 0.20 M solution of ammonia? The  $K_b$  value for ammonia is  $1.8 \times 10^{-5}$

- a ☐  $1.8 \times 10^{-5}$
- b ☒  $5.2 \times 10^{-12}$
- c ☐  $2.8 \times 10^{-10}$
- d ☐  $5.5 \times 10^{-10}$

الإجابة الصحيحة هي:

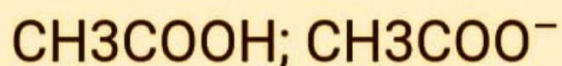
$$5.2 \times 10^{-12}$$

In the following reaction in aqueous solution,  
the acid reactant is \_\_\_\_\_ and its  
\_\_\_\_\_ conjugate base product is



- a. ☐  $\text{NH}_3; \text{NH}_4^+$
- b. ☒  $\text{CH}_3\text{COOH}; \text{CH}_3\text{COO}^-$
- c. ☐  $\text{CH}_3\text{COOH}; \text{NH}_4^+$
- d. ☐  $\text{NH}_3; \text{CH}_3\text{COO}^-$

الإجابة الصحيحة هي:



The pOH of a solution of NaOH is 11.30.  
?What is the  $[H^+]$  for this solution

4.0 x 10<sup>-12</sup> .a ☐

2.5 x 10<sup>-3</sup> .b ☐

✓ 2.0 x 10<sup>-3</sup> .c ☒

5.0 x 10<sup>-12</sup> .d ☐

الإجابة الصحيحة هي:

2.0 x 10<sup>-3</sup>

سؤال 7

صحيح

درجة 1.00 من 1.00

علم هذا السؤال

**Ammonium sulphate salt is**

☒ a. acidic salt

☐ b. basic salt

☐ c. complex salt

☐ d. neutral salt

الإجابة الصحيحة هي:

acidic salt

سؤال 3

صحيح

درجة 1.00 من 1.00

٣ علم هذا السؤال

**When the aqueous solution of  $\text{CH}_3\text{COONH}_4$  is diluted, then its degree of hydrolysis .does not change**

False .a ☐

✓ True .b ☒

الإجابة الصحيحة هي:

True

All Brønsted acids are Lewis acids, but the reverse is not true.

✓ True .a ☒

False .b ☐

الإجابة الصحيحة هي:

True

## سؤال 6

صحيح

درجة 2.00 من 2.00

علم هذا السؤال

A cup of coffee has a hydroxide ion concentration of  $1.0 \times 10^{-10}$  M. What is the pH of this coffee

7 .a ☐10 .b ☐✓ 4 .c ☒ $1.0 \times 10^{-4}$  .d ☐

الإجابة الصحيحة هي:

4

## سؤال 7

خطأ

درجة 0.00 من 1.00

علم هذا السؤال

All Brønsted acids are Lewis acids, but the reverse is not true.

False .a ☐

✓ True .b ☒

الإجابة الصحيحة هي:

True

?Which of the following happens to the pH of an acid when it is neutralised

- ✓ The pH increases towards 7 .a ☒
- The pH decreases towards 7 .b ☐
- The pH does not change .c ☐

الإجابة الصحيحة هي:

The pH increases towards 7

**?Which of the following is the strongest conjugate base**

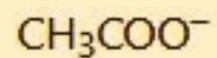
✓ **a** ☒  $\text{CH}_3\text{COO}^-$

**b** ☐  $\text{NO}_3^-$

**c** ☐  $\text{Cl}^-$

**d** ☐  $\text{SO}_4^{2-}$

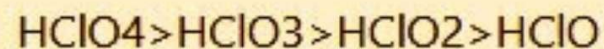
الإجابة الصحيحة هي:



The correct order of acid strength of oxyacids is

- ✓ ☒ a.  $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HClO}$
- ☐ b.  $\text{HClO} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}_4$
- ☐ c.  $\text{HClO}_3 > \text{HClO}_4 > \text{HClO} > \text{HClO}_2$
- ☐ d.  $\text{HClO}_2 > \text{HClO}_3 > \text{HClO} > \text{HClO}_4$

الإجابة الصحيحة هي:



What is the pH of a 0.15 M solution of weak acid ammonium bromide? The  $K_b$  value for ammonia is  $1.8 \times 10^{-5}$ .

11.22 .a ☐

✓ 5.04 .b ☒

2.78 .c ☐

7.00 .d ☐

الإجابة الصحيحة هي:

5.04

A 0.10 M solution of a weak acid, HX, is 0.059% ionized. Evaluate  $K_a$  for the acid

- a ☐  $6.5 \times 10^{-7}$
- ✓ b ☒  $3.5 \times 10^{-8}$
- c ☐  $3.8 \times 10^{-9}$
- d ☐  $7.0 \times 10^{-6}$

الإجابة الصحيحة هي:

$$3.5 \times 10^{-8}$$

?What would be the pH of the solution formed when sodium oxide dissolves in water

Less than 7 .a ☐

Equal to 7 .b ☐

✓ Above 7 .c ☒

الإجابة الصحيحة هي:

Above 7

The relative strengths of acids can't be explained qualitatively in terms of their molecular structures.

True .a ☐

✓ False .b ☒

الإجابة الصحيحة هي:

False

50 ml of 0.05 M  $\text{HNO}_3$  is added to 50 ml of 0.025 M  $\text{KOH}$ . Calculate the pH of the resultant solution.

1.75 .a ☐

✓ 1.903 .b ☒

1.309 .c ☐

$1.25 \times 10^{-3}$  .d ☐

الإجابة الصحيحة هي:

1.903

?What is the pH of a 0.500 M solution of trimethylamine ( $pK_b = 4.13$ )

- a. 2.22 ☐
- b. 11.8 ☒
- c. 0.00609 ☐
- d. 4.42 ☐

الإجابة الصحيحة هي:

11.8

The pH of a 0.02 M solution of an unknown weak acid is 3.7. what is the  $pK_a$  of this acid

- a. 9.3 ☐
- b. 5.7 ☐
- c. 5.01 ☐
- d. 3.9 ☒

الإجابة الصحيحة هي:

5.7

What is the pH of a 0.010 M solution of acetic acid?  $K_a$  for acetic acid is  $1.8 \times 10^{-5}$

4.74 .a ☐

✓ 3.37 .b ☒

2.00 .c ☐

2.74 .d ☐

الإجابة الصحيحة هي:

3.37

When a salt of weak acid and weak base is dissolved in water at  $25^{\circ}\text{C}$ , the pH of the resulting solution will always

- ✓ a ☒ depend upon  $K_a$  and  $K_b$  values
- b ☐ be less than 7
- c ☐ be 7
- d ☐ be greater than 7

الإجابة الصحيحة هي:  
depend upon  $K_a$  and  $K_b$  values

?What happens to the pH of an acidic solution as water is added

It decreases .a ☐

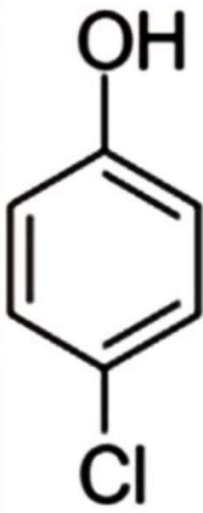
✓ It increases .b ☒

It stays the same .c ☐

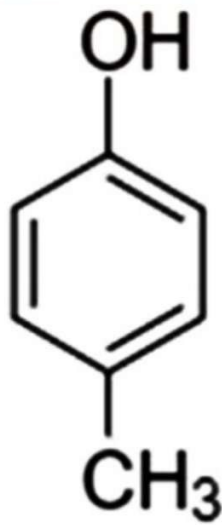
الإجابة الصحيحة هي:

It increases

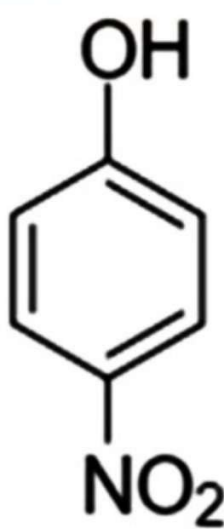
Arrange the following compounds in the  
order of decreasing acidity



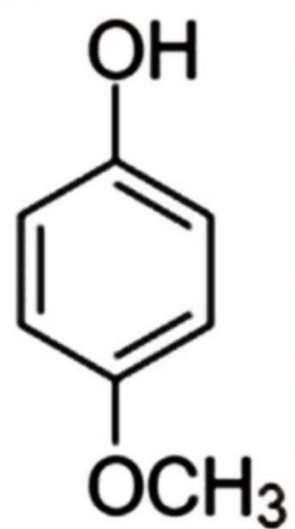
(I)



(II)



(III)



(IV)

II>IV>I>III .a ☐

I>II>III>IV .b ☐

IV>III>I>II .c ☐

✓ III>I>II>IV .d ☒

الإجابة الصحيحة هي:

III>I>II>IV

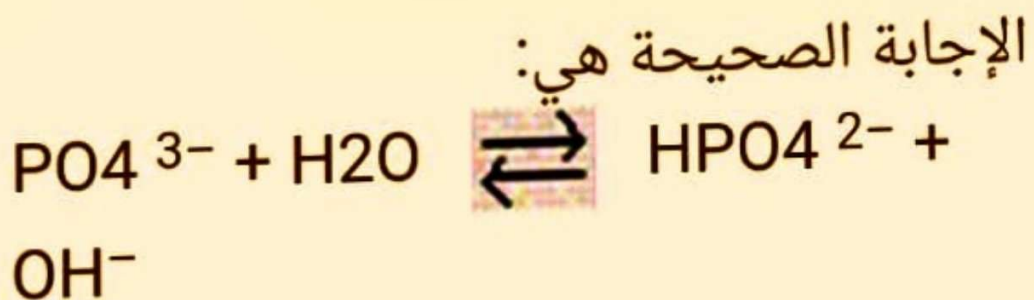
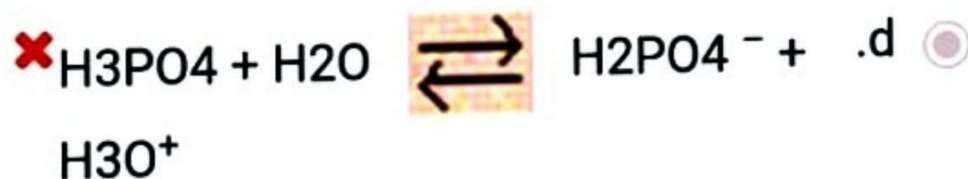
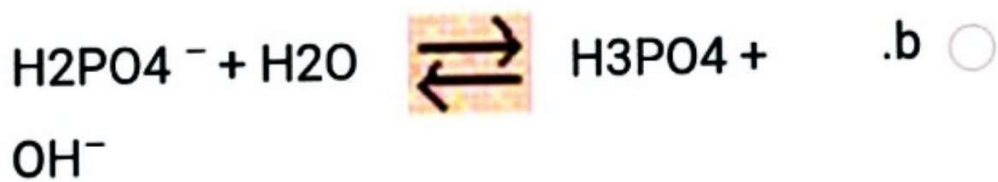
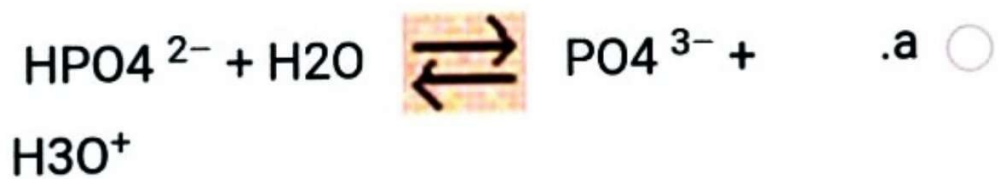
A salt 'X' is dissolved in water of pH=7. The resulting solution becomes alkaline in nature. The salt is made up of

- ✓ A weak acid and strong base .a ☒
- A strong acid and weak base .b ☐
- A strong acid and strong base .c ☐
- A weak acid and weak base .d ☐

الإجابة الصحيحة هي:

A weak acid and strong base

Which equilibrium is most important in determining the pH of a solution of sodium phosphate?



Formula for Percent Ionization  
(symbols) =  $[H_3O^+]_{\text{equil}} / [HA]_{\text{init}} \times 100\%$

False .a ☐

✓ True .b ☒

الإجابة الصحيحة هي:

True

The following acids have been arranged in the order of decreasing acid strength.

-Identify the correct order



$\text{III} > \text{II} > \text{I}$  .a ☐

$\text{II} > \text{I} > \text{III}$  .b ☐

$\text{I} > \text{III} > \text{II}$  .c ☐

✓  $\text{I} > \text{II} > \text{III}$  .d ☒

الإجابة الصحيحة هي:



Which of the following is the conjugate acid  
?  $^-$  of the hydrogen phosphate ion,  $\text{HPO}_4^{2-}$

$\text{H}_3\text{PO}_4$  .a ☐

$\text{PO}_4^{3-}$  .b ☐

$\text{HPO}_4^{2-}$  .c ☐

✓  $\text{H}_2\text{PO}_4^-$  .d ☒

الإجابة الصحيحة هي:



What is the percent ionization in each of the following solutions? 0.10 M  $\text{NH}_3$



✓ 1.34% .a ☒

% 1.43 .b ☐

$1.8 \times 10^{-5}$  .c ☐

$1.34 \times 10^{-3}$  .d ☐

الإجابة الصحيحة هي:

1.34%

Which of the following is the conjugate acid  
of  $\text{NH}_2^-$ ?

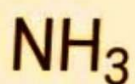
$\text{NH}_4\text{OH}$  .a ☐

$\text{NH}_2^-$  .b ☐

$\text{NH}_4^+$  .c ☐

✓  $\text{NH}_3$  .d ☒

الإجابة الصحيحة هي:



\_\_\_\_\_, The stronger the acid

a ☐ the more concentrated the acid

b ☒ the weaker its conjugate base.

c ☐ the less concentrated the conjugate base.

d ☐ the stronger its conjugate base.

The least stable oxo-anion among the  
: following is

✓ ClO<sup>-</sup> .a ☒

ClO<sub>3</sub><sup>-</sup> .b ☐

ClO<sub>4</sub><sup>-</sup> .c ☐

ClO<sub>2</sub><sup>-</sup> .d ☐

In the Brønsted–Lowry definition of acids and bases, a base \_\_\_\_\_

- a ☐ is a proton donor
- b ☐ breaks stable hydrogen bonds.
- c ☒ is a proton acceptor
- d ☐ forms stable hydrogen bonds

A 0.10 M solution of a weak acid, HX, is 0.059% ionized. Evaluate  $K_a$  for the acid

✓ ☒ a.  $3.5 \times 10^{-8}$

☐ b.  $7.0 \times 10^{-6}$

☐ c.  $3.8 \times 10^{-9}$

☐ d.  $6.5 \times 10^{-7}$

الإجابة الصحيحة هي:

$3.5 \times 10^{-8}$

What type of solution would be formed when  
sulfur dioxide dissolves in water

✓ Acidic solution .a ☒

Neutral solution .b ☐

Alkaline solution .c ☐

الإجابة الصحيحة هي:

Acidic solution

The relative strengths of acids can't be explained qualitatively in terms of their molecular structures.

☒ True .a

☐ False .b

الإجابة الصحيحة هي:

False

Which of the following is the conjugate acid of  $\text{NH}_2^-$ ?

✓  $\text{NH}_3$  .a ☒

$\text{NH}_2^-$  .b ☐

$\text{NH}_4\text{OH}$  .c ☐

$\text{NH}_4^+$  .d ☐

الإجابة الصحيحة هي:

$\text{NH}_3$

Identify the most acidic oxide among the following oxides

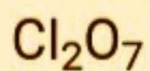
$P_4O_{10}$  .a ☐

✓  $Cl_2O_7$  .b ☒

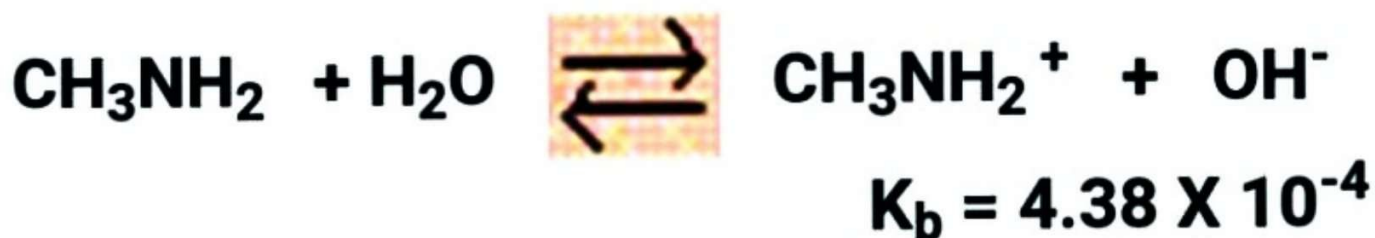
$N_2O_5$  .c ☐

$SO_3$  .d ☐

الإجابة الصحيحة هي:



What is the percent ionization in each of the following solutions? 0.10 M  $\text{CH}_3\text{NH}_2$



$6.62 \times 10^{-3}$  .a ☐

✓ 6.62% .b ☒

$4.38 \times 10^{-4}$  .c ☐

$6.62 \times 10^{-5}$  .d ☐

**When sulphuric acid reacts with eggshell  
( $\text{CaCO}_3(\text{s})$ ) it produces**

- hydrogen gas .a ☐
- ✓ carbon dioxide gas .b ☒
- nitrogen gas .c ☐
- carbon monoxide .d ☐

Which of the following is **true** about a 0.10 M  
?solution of a weak acid, HX

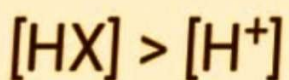
$[H^+] = 0.10 \text{ M}$  .a ☐

✓  $[HX] > [H^+]$  .b ☒

$[X^-] = 0.10 \text{ M}$  .c ☐

$\text{pH} = 1$  .d ☐

الإجابة الصحيحة هي:



Which one of the following is not a conjugate  
acid–base pair

HS<sup>−</sup> and H<sub>2</sub>S .a ☐

H<sub>2</sub>PO<sub>4</sub><sup>−</sup> and HPO<sub>4</sub><sup>2−</sup> .b ☐

NH<sub>3</sub> and NH<sub>4</sub><sup>+</sup> .c ☐

✓ H<sub>3</sub>O<sup>+</sup> and OH<sup>−</sup> .d ☒

الإجابة الصحيحة هي:

H<sub>3</sub>O<sup>+</sup> and OH<sup>−</sup>

The product of the ionization constant of an acid and the ionization constant of its conjugate base is equal to the ion-product constant of water.

✓ True .a ☒

False .b ☐

الإجابة الصحيحة هي:

True

According to Lewis concept, an  
:acid is

✓ a ☒ electron pair acceptor

b ☐ proton acceptor

c ☐ proton donor

d ☐ electron pair donor

الإجابة الصحيحة هي:

electron pair acceptor

Which of the following solutions has the lowest pH at 25°C? (No calculations required.)

0.2 M hypochlorous acid .a ☐

0.2 M sodium hydroxide .b ☐

✓ 0.2 M benzoic acid .c ☒

0.2 M ammonia .d ☐

الإجابة الصحيحة هي:

0.2 M benzoic acid

Solutions of sodium salts of the acids in the following table are prepared with an initial concentration of 0.500 M. Which solution will have the highest pH and be the most basic?

| Acid | pKa   |
|------|-------|
| HA   | 4.00  |
| HB   | 7.00  |
| HC   | 10.00 |
| HD   | 11.00 |

NaC .a ☐

NaA .b ☐

✓ NaD .c ☒

NaB .d ☐

الإجابة الصحيحة هي:

NaD

Which one of the following is a strong  
?electrolyte

$\text{H}_2\text{O}$  .a ☐

✓  $\text{KF}$  .b ☒

$\text{HF}$  .c ☐

$\text{HNO}_2$  .d ☐

When a salt of weak acid and weak base is dissolved in water at 25°C, the pH of the resulting solution will always

be 7 .a ☐

be greater than 7 .b ☐

✓ depend upon  $K_a$  and  $K_b$  values .c ☒

be less than 7 .d ☐

Percent ionization is another measure of the strength of acids. The more dilute a solution of a weak acid, the greater the percent ionization of the acid.

✓ True .a ☒

False .b ☐

:According to Lewis concept acid & base pair is

✓ **BF<sub>3</sub>, NH<sub>3</sub>** .a ☒

Ag<sup>+</sup>, Cl<sup>-</sup> .b ☐

None of these .c ☐

H<sub>2</sub>O, H<sub>2</sub> .d ☐

Trimethylamine,  $(\text{CH}_3)_3\text{N}$ , is a weak base ( $K_b = 6.4 \times 10^{-5}$ ) that hydrolyzes by the following equilibrium:  $(\text{CH}_3)_3\text{N} + \text{H}_2\text{O} \rightarrow (\text{CH}_3)_3\text{NH}^+ + ^-\text{OH}$

What is the pH of a 0.1 M solution of  $(\text{CH}_3)_3\text{NH}^+$ ?

9.6 .a ☐

✓ 4.4 .b ☒

7.8 .c ☐

6.5 .d ☐