

B 1. According to one acid-base theory, water acts as an acid when an H_2O molecule **BAAD**
 A) accepts an H^+ B) donates an H^+
~~C) accepts an H^-~~ ~~D) donates an H^-~~

A 2. Given the reaction:
 $HSO_4^- + HPO_4^{2-} \leftrightarrow SO_4^{2-} + H_2PO_4^-$
 A B CB CA

Which pair represents an acid and its conjugate base?
 A) HSO_4^- and SO_4^{2-}
 B) HSO_4^- and HPO_4^{2-}
 C) SO_4^{2-} and $H_2PO_4^-$
 D) SO_4^{2-} and HPO_4^{2-}

D 3. In the reaction
 $NH_3 + H_2O \leftrightarrow NH_4^+ + OH^-$
 B A CA CB
 A conjugate acid-base pair is

A) NH_3 and H_2O B) NH_3 and OH^-
 C) H_2O and NH_4^+ D) H_2O and OH^-

A 4. Given the reaction:
 $H_2O + HCl \leftrightarrow H_3O^+ + Cl^-$
 B A CA CB

The Brønsted-Lowry base for the forward reaction is
 A) H_2O B) HCl C) H_3O^+ D) Cl^-

D 5. Given the equilibrium system:
 $NH_3(aq) + H_2O(l) \leftrightarrow NH_4^+(aq) + OH^-(aq)$
 H₂O → OH⁻ lost H⁺

According to the Brønsted-Lowry theory, the $H_2O(l)$ acts as
 A) a base, by receiving a proton
 B) a base, by donating a proton
 C) an acid, by receiving a proton
 D) an acid, by donating a proton $H^+ = \text{proton}$

A 6. In the reaction $H_2S + NH_3 \leftrightarrow NH_4^+ + HS^-$, the two Brønsted-Lowry bases are
 A) NH_3 and HS^- B) NH_3 and NH_4^+
 C) H_2S and NH_3 D) H_2S and HS^-

7. Which is the conjugate acid of HSO_4^- ?
 A) H_2SO_4 B) H_3O^+
 C) HSO_3^- D) SO_4^{2-}
 CA = add H⁺

8. Given the reaction:
 $NH_3(g) + H_2O(l) \leftrightarrow NH_4^+(aq) + OH^-(aq)$
 B A CA CB
 Which is the conjugate acid-base pair?

A) $H_2O(l)$ and $NH_4^+(aq)$
 B) $H_2O(l)$ and $NH_3(g)$
 C) $NH_3(g)$ and $OH^-(aq)$
 D) $NH_3(g)$ and $NH_4^+(aq)$

9. Given the balanced equation representing a reaction:
 $HCl + H_2O \rightarrow H_3O^+ + Cl^-$
 A B CA CB
 The water molecule acts as a base because it

A) donates an H^+ B) accepts an H^+
 C) donates an OH^- D) accepts and OH^-

10. The conjugate base of NH_4^+ is
 A) NH_3 B) OH^-
 C) H_2O D) H_3O^+
 CB = minus H⁺ (one less H⁺)

11. The conjugate acid of the HS^- ion is
 A) H^+ B) S C) H_2O D) H_2S

12. In the reaction:
 $H_2PO_4^- + H_2O \leftrightarrow H_3PO_4 + OH^-$
 B A CA CB
 Which pair represents an acid and its conjugate base?

A) H_2O and $H_2PO_4^-$
 B) H_2O and H_3PO_4
 C) H_3PO_4 and OH^-
 D) H_3PO_4 and $H_2PO_4^-$