Name _____
Blk:____Date:_____

Chemistry 12
Brønsted-Lowry Acids and Equilibria

____
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1. Write the formula for a ***proton*** (1 mark) _____

2. Write the formula for a ***hydrated proton*** (1 mark)_____

3. Write the formula for a ***hydronium*** ion (1 mark) _____

4. Draw the Lewis Structures for the reaction between water and the proton to form hydronium: (3 marks)

5. Give the ***Arrhenius*** definition of an ***acid*** (1 mark) _____

_____

6. Give the ***Arrhenius*** definition of a ***base*** (1 mark) _____

_____

7. Give the ***Brønsted-Lowry*** definition of an ***acid*** (1 mark):

_____

8. Give the ***Brønsted-Lowry*** definition of a ***base*** (1 mark)

_____

9. Given the equation: $HCO_3^- + H_2S \rightleftharpoons H_2CO_3 + HS^-$

   a) The **acid** on the left side is (1 mark) _____

   b) The **base** on the left side is (1 mark) _____

   c) The **acid** on the right side is (1 mark) _____

   d) The **base** on the right side is (1 mark) _____

____
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10. Find the ***conjugate acids*** of each of the following (5 marks)

a) HPO_4^{2-} _____

b) PO_4^{3-} _____

c) HSO_4^- _____

d) NH_3 _____

e) $H_2PO_4^-$ _____

11. Find the ***conjugate bases*** of each of the following (5 marks)

a) $H_2PO_4^-$ _____

b) H_3PO_4 _____

c) HSO_4^- _____

d) H_2O _____

e) HPO_4^{2-} _____

12. Give the formulas of a conjugate acid/base pair in which the ***dihydrogen citrate ion ($H_2C_6H_5O_7^{1-}$) is the <u>conjugate base</u>***.(2 marks)

Conjugate acid _____ Conjugate base _____

13. Give the formulas of a conjugate acid/base pair in which the ***dihydrogen citrate ion($H_2C_6H_5O_7^{1-}$) is the <u>conjugate acid</u>***.(2 marks)

Conjugate acid _____ Conjugate base _____

14. Is the dihydrogen citrate ion ***amphiprotic***?(1mark) _____

Explain your answer. (1 mark) _____

_____

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15. Formic acid, HCOOH, is the substance responsible for the sting in ant bites. Write an equation showing it acting as an ACID when reacted with water. Label the acids and bases in the forward and reverse reactions. Identify the two acid-base pairs. (5 marks)

16. Pyridine, C_5H_5N, is a Bronsted-Lowry base. It is used in the production of many pharmaceuticals. Write an equation showing it acting as a BASE when reacted with water. Label the acids and bases in the forward and reverse reactions. Identify the two acid-base pairs. (5 marks)