Name \_\_\_\_

	Blk:Date:			
	Chemistry 12 Bronsted-Lowry Acids and Equilibria  40  40			
1.	Write the formula for a <i>proton</i> (1 mark)			
2.	Write the formula for a <i>hydrated proton</i> (1 mark)			
3.	Write the formula for a <i>hydronium</i> ion (1 mark)			
4.	Draw the Lewis Structures for the reaction between water and the proton to form hydronium: (3 marks)			
5.	Give the <i>Arrhenius</i> definition of an <i>acid</i> (1 mark)			
<i>J</i> .	Give the Arrhentus definition of an ucu (1 mark)			
6.	Give the <i>Arrhenius</i> definition of a <i>base</i> (1 mark)			
7.	Give the <b>Bronsted-Lowry</b> definition of an <b>acid</b> (1 mark):			
8.	Give the <b>Bronsted-Lowry</b> definition of a <b>base</b> (1 mark)			
9.	Given the equation: $HCO_3^- + H_2S \rightleftharpoons H_2CO_3 + HS^-$			
	a) The <b>acid</b> on the left side is (1 mark)			
	b) The <b>base</b> on the left side is (1 mark)			
	c) The <b>acid</b> on the right side is (1 mark)			
14	d) The <b>base</b> on the right side is (1 mark)			

a) HPO4 <sup>2-</sup> b) PO4 <sup>3-</sup> c) HSO4 <sup>-</sup> d) NH <sub>3</sub> e) H <sub>2</sub> PO4 <sup>-</sup> 11. Find the <i>conjugate bases</i> of each of the following (5 marks) a) H <sub>2</sub> PO4 <sup>-</sup> b) H <sub>3</sub> PO4 c) HSO4 <sup>-</sup> d) H <sub>2</sub> O e) HPO4 <sup>2-</sup> 12. Give the formulas of a conjugate acid/base pair in which the <i>dihydrogen citrate ion</i> (H <sub>2</sub> C <sub>6</sub> H <sub>3</sub> O <sub>7</sub> <sup>1-</sup> ) 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 <i>dihydrogen citrate ion</i> H <sub>2</sub> C <sub>6</sub> H <sub>3</sub> O <sub>7</sub> <sup>1-</sup> ) is the <u>conjugate acid</u> .(2 marks)  Conjugate acid Conjugate base  14. Is the dihydrogen citrate ion <i>amphiprotic</i> ?(1mark)  Explain your answer. (1 mark)	10.	Find	Find the <i>conjugate acids</i> of each of the following (5 marks)			
c) HSO <sub>4</sub>		a)	HPO <sub>4</sub> <sup>2-</sup>			
d) NH <sub>3</sub>		b)	PO4 <sup>3-</sup>			
e) H <sub>2</sub> PO <sub>4</sub>		c)	HSO <sub>4</sub> -			
a) H <sub>2</sub> PO <sub>4</sub> <sup>-</sup>		d)	NH <sub>3</sub>			
a) H <sub>2</sub> PO <sub>4</sub> b) H <sub>3</sub> PO <sub>4</sub> c) HSO <sub>4</sub> d) H <sub>2</sub> O  e) HPO <sub>4</sub> <sup>2</sup> 12. Give the formulas of a conjugate acid/base pair in which the <i>dihydrogen citrate ion</i> (H <sub>2</sub> C <sub>6</sub> H <sub>3</sub> O <sub>7</sub> <sup>1</sup> -) 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 <i>dihydrogen citrate ion</i> H <sub>2</sub> C <sub>6</sub> H <sub>3</sub> O <sub>7</sub> <sup>1</sup> -) is the <u>conjugate acid</u> .(2 marks)  Conjugate acid Conjugate base  14. Is the dihydrogen citrate ion <i>amphiprotic</i> ?(1mark)		e)	H <sub>2</sub> PO <sub>4</sub> -			
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e) HPO4 <sup>2-</sup>		c)	HSO <sub>4</sub> -			
12. Give the formulas of a conjugate acid/base pair in which the <i>dihydrogen citrate ion</i> ( $H_2C_6H_5O_7^{1-}$ ) 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 <i>dihydrogen citrate ion</i> $H_2C_6H_5O_7^{1-}$ ) is the <u>conjugate acid</u> .(2 marks)  Conjugate acid Conjugate base  14. Is the dihydrogen citrate ion <i>amphiprotic</i> ?(1mark)		d)	H <sub>2</sub> O			
Conjugate acid Conjugate base  Conjugate acid Conjugate base  Conjugate acid Conjugate base  Give the formulas of a conjugate acid/base pair in which the dihydrogen citrate ion H <sub>2</sub> C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> <sup>1-</sup> ) is the conjugate acid Conjugate base  Conjugate acid Conjugate base  Is the dihydrogen citrate ion amphiprotic?(1mark)  Explain your answer. (1 mark)		e)	HPO4 <sup>2-</sup>			
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Explain your answer. (1 mark)			Conjugate acid	Conjugate base		
<del>16</del>	14.	Is the	e dihydrogen citrate ion amph	niprotic?(1mark)		
		Explain your answer. (1 mark)				
	16					

**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<sub>5</sub>H<sub>5</sub>N, 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)