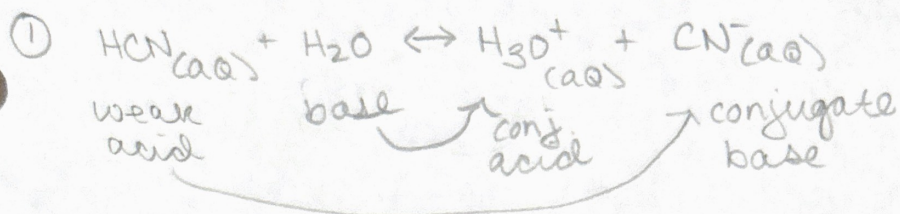
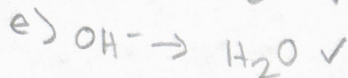
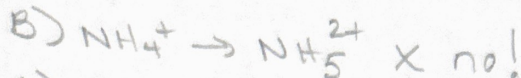


ACID BASE PRACTICE test #2

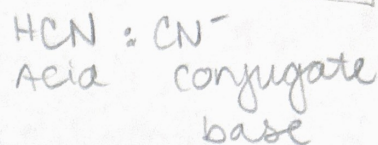


TRICKY! They aren't asking to just identify pairs. They want the function of the eq. in the direction written Answer: B

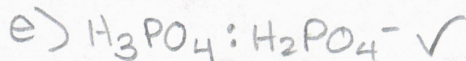
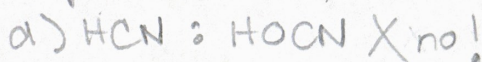
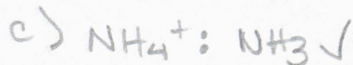
② Bronsted-Lowry = accepts a H^+



Answer: B



③ need to be one H^+ apart, more H^+ : one less H^+



Answer: D

④ Strongest acid = largest K_a

Answer: E

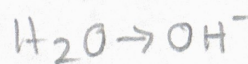
⑤ Weak electrolyte $\rightarrow$ weak acid or base

Answer: A

⑥ $\text{HBr} = \text{strong acid}$ $\text{pH} = -\log(4.2 \times 10^{-4}) = 3.38$

Answer: B

⑦ Conjugate base = one less H^+



Answer: E

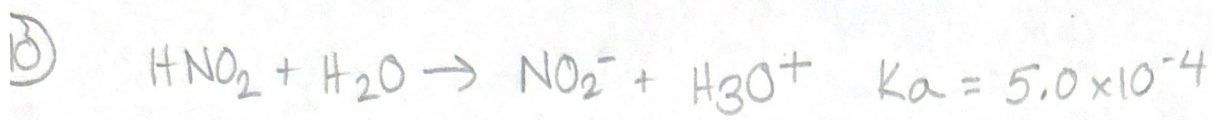
⑧ $\text{pH} = -\log(1.34 \times 10^{-4}) = 3.87$

Answer: C

⑨ $\text{pH } 12.8$ vs Scale of 1-14,

Answer: E

I would say very basic. I think slight basic would be closer to 7



So if we want the Rxn of NO_2^- acting as a base we actually want the K_b of HNO_2

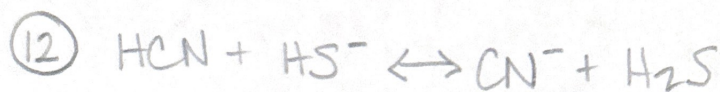
$$K_w = K_a \times K_b \quad 1 \times 10^{-14} = (5 \times 10^{-4})(K_b)$$

$$K_b = 2 \times 10^{-11} \quad \boxed{\text{Answer: A}}$$

11) Lewis = about e^- donors / Receivers

Bronsted-Lowry $\rightarrow$ donating a H^+ = acid (e^- deficient)
taking H^+ = base (e^- rich)

$\therefore$ Lewis base donates e^- pair Answer: D

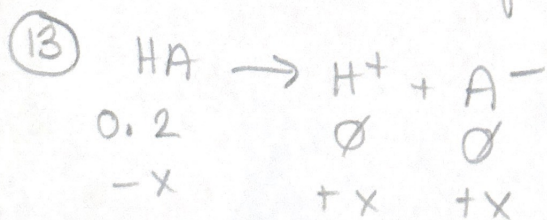


weaker,
stays
together
more

$\leftarrow$ lies to
left

$\uparrow$ stronger acid, more likely
to dissociate

$\therefore$ Answer: A



$\downarrow$
 $\text{pH} = 3.82$

$$[\text{H}^+] = 10^{-3.82}$$

$$= 1.51 \times 10^{-4}$$

$$= x$$

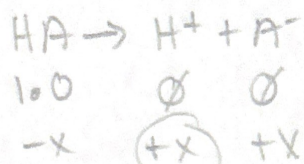
$$K_a = \frac{[\text{H}^+][\text{A}^-]}{[\text{HA}]}$$

$$= \frac{(1.51 \times 10^{-4})(1.51 \times 10^{-4})}{(0.2 - 1.51 \times 10^{-4})}$$

$$= 1.15 \times 10^{-7}$$

Answer: C

6) pH 3.18 $10^{-3.18} = [H^+] = 6.61 \times 10^{-4}$



$$K_a = \frac{[H^+][A^-]}{[HA]}$$

$$= \frac{(x)(x)}{(1.0-x)} \approx \frac{x^2}{1.0}$$

Answer: A

$$= \frac{(6.61 \times 10^{-4})^2}{1.0}$$

17) pH 0.054 NaOH

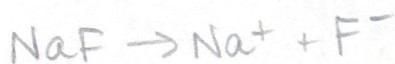
$$= 4.37 \times 10^{-7}$$

$$pOH = -\log(0.054) = 1.27 \quad pH = 14 - pOH$$

$$= 14 - 1.27 = 12.7$$

Answer: d

18) salt solution



came from:

NaOH
∴ Na⁺
weak A

HF
∴ F⁻
strong B

⇒ hydrolysis!

$$K_a HF = 7.1 \times 10^{-4}$$

BUT now I need K_b

For F⁻

$$K_w = K_a \cdot K_b$$



BH⁺

$$1.0 \times 10^{-14} = (7.1 \times 10^{-4})(K_b)$$

$$K_b = 1.41 \times 10^{-11}$$

$$K_b = \frac{[HF][OH^-]}{[F^-]}$$

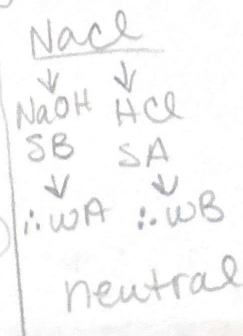
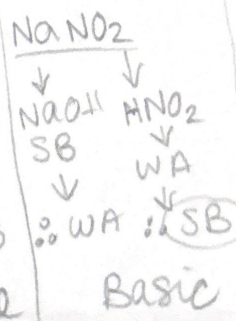
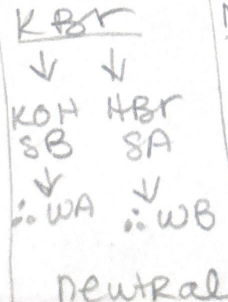
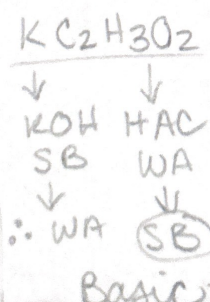
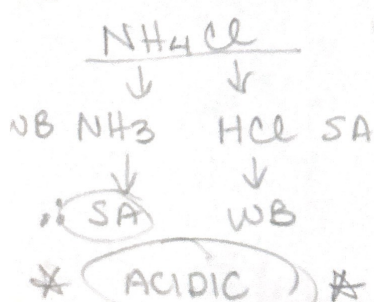
$$1.41 \times 10^{-11} = \frac{(x)(x)}{(0.144-x)} \approx \frac{x^2}{0.144}$$

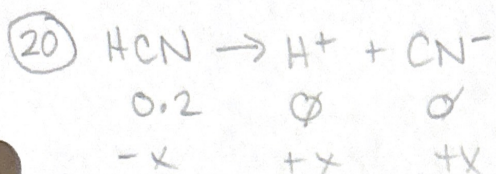
$$x = 1.42 \times 10^{-6}$$

$$pOH = -\log(1.42 \times 10^{-6}) = 5.85$$

$$pH = 14 - 5.85 = 8.15 \quad \text{Answer: d}$$

19) lowest pH = most acidic Answer: A





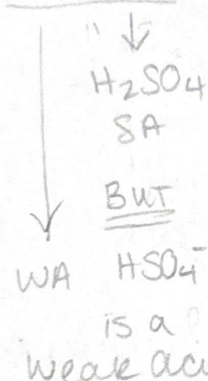
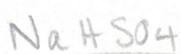
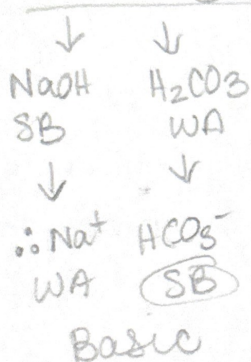
$$K_a = \frac{[\text{H}^+][\text{CN}^-]}{[\text{HCN}]}$$

$$4.0 \times 10^{-10} = \frac{(x)(x)}{(0.2-x)} \approx \frac{x^2}{0.2} \quad x = 8.94 \times 10^{-6}$$

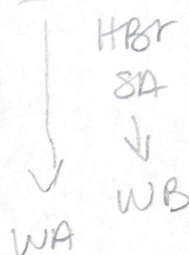
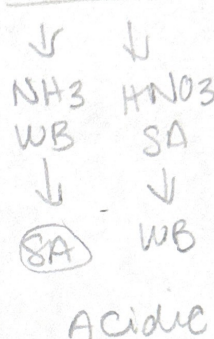
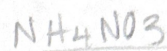
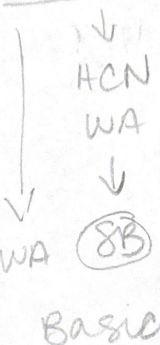
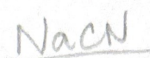
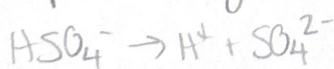
$$\text{pH} = -\log(8.94 \times 10^{-6}) = 5.05$$

Answer: B

(21) not change pH = neutral salt



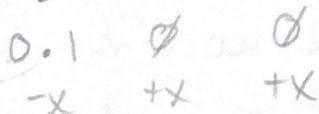
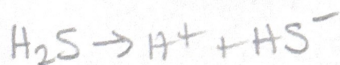
Super tricky!



* neutral *

Answer: E

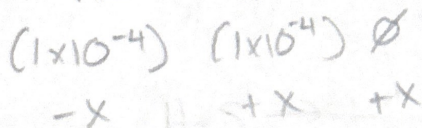
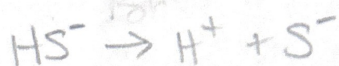
(22)



$$K_{a1} = \frac{[\text{H}^+][\text{HS}^-]}{[\text{H}_2\text{S}]}$$

$$= \frac{(x)(x)}{(0.1-x)} = 1 \times 10^{-7}$$

$$\approx x^2/0.1 \quad x = 1 \times 10^{-4}$$



$$K_{a2} = \frac{[\text{H}^+][\text{S}^{2-}]}{[\text{HS}^-]}$$

$$= \frac{(1 \times 10^{-4} + x)(x)}{(1 \times 10^{-4} - x)} = 1.3 \times 10^{-13}$$

$$\approx \frac{(1 \times 10^{-4})(x)}{(1 \times 10^{-4})}$$

$$x = 1.3 \times 10^{-13}$$

Answer: C

* if we didn't use 5% rule we would see

$[\text{S}^{2-}]$ is a little different

but remember, they

won't ask us to use quadratic!