

\* O + N Nucleophiles w/ Carbonyls  
Warm-up Answers

① Hydrates / gem diols

② hemiacetal : acetal

③ Ethylene Glycol (  $\text{HOCH}_2\text{CH}_2\text{OH}$  )

④ Acid ( $\text{H}_3\text{O}^+$ )

⑤ imines : Schiff Bases : 4.5

⑥ enamines

⑦ oxime

⑧ phenylhydrazine

⑨ 2,4-Dinitrophenylhydrazine (2,4-DNP)

⑩ Semicarbazone

⑪ the  $\text{NH}_2$  next to the carbonyl can not react b/c the lone pair  $e^-$  are tied up in resonance w/ the carbonyl