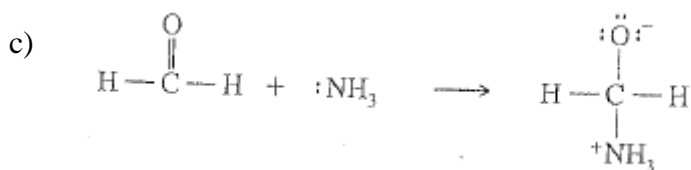
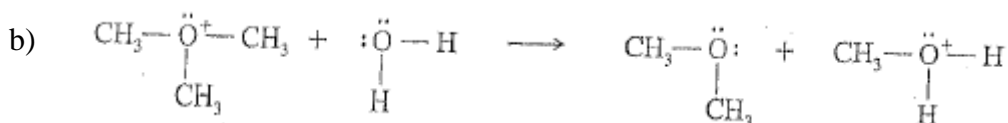
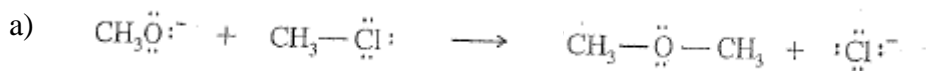
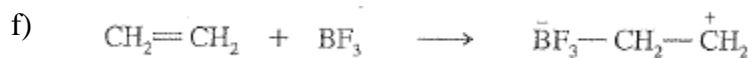
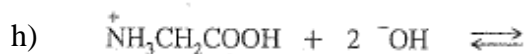
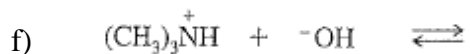
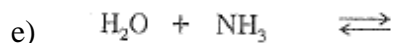
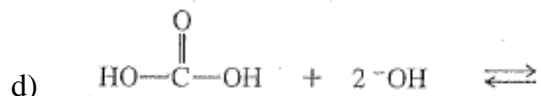
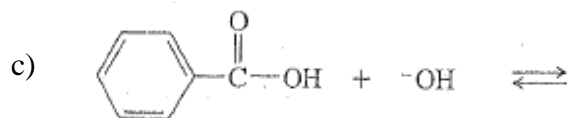
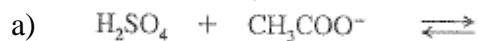


- All the following compounds are acids. Rank them in order from lowest to highest acidic strength. (*Don't use the pKa table*)
 $\text{CH}_3\text{CH}_2\text{SO}_3\text{H}$ $\text{CH}_3\text{CH}_2\text{OH}$ $\text{CH}_3\text{CH}_2\text{COOH}$ $\text{CH}_3\text{CHClCOOH}$ $\text{ClCH}_2\text{CH}_2\text{COOH}$
- Rank the following in increasing order of acidity.
 NH_3 HF H_2SO_4 CH_3OH CH_3COOH H_3O^+ H_2O
- Rank the following in increasing order of basicity.
 NH_3 CH_3O^- H_2O NaOH NH_2^- CH_3COO^- HSO_4^-
- Label the reactants in the following reactions as acids and bases (Lewis). Use curved arrows to show the movement of electrons.

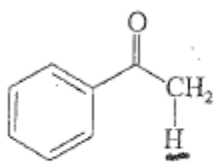




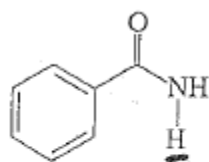
5. Predict the products of the following acid-base reactions.



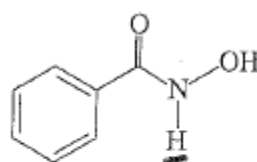
6. The following compounds are listed in increasing order of acidity. In each case, the most acidic proton is underlined. Answer the questions following the structures.



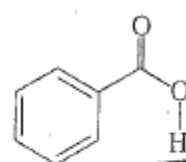
W, $pK_a = 25$



X, $pK_a = 23$



Y, $pK_a = 8.8$



Z, $pK_a = 4.2$

- a) Show the structures of the conjugate base of each acid include any resonance forms.

- b) Explain why X is stronger acid than W.

- c) Explain why Y is stronger acid than X.

- d) Explain why Z is stronger acid than Y.