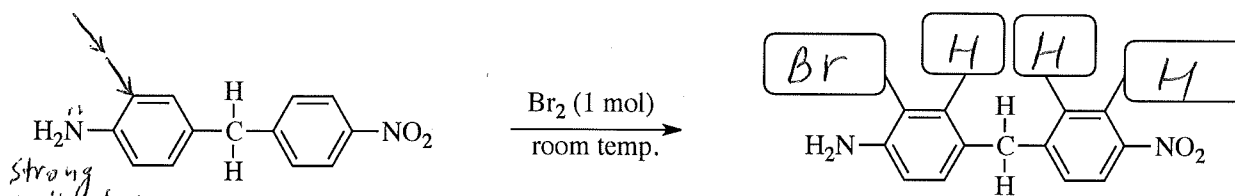
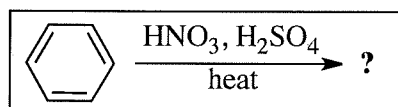


Quiz 4 Key

1. (4) Complete the following reaction by placing **H** or **Br** in the provided boxes (1 pt each box):

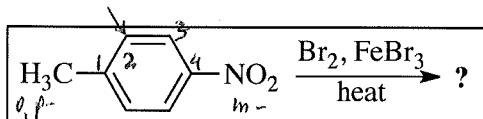


2. (9) Circle the **major product** in each of the following reactions (3 pts each):



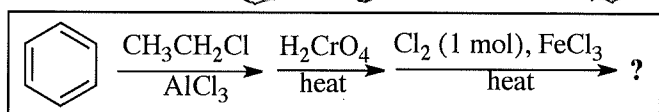
benzenesulfonic acid nitrophenol *p*-nitrophenol

aniline *m*-nitrobenzenesulfonic acid **nitrobenzene**



3-bromo-4-methylaniline 3-bromo-4-nitrotoluene *p*-bromotoluene

3-bromo-4-aminobenzonitrile **2-bromo-4-nitrotoluene**



p-chloroethylbenzene

o-chloroethylbenzene

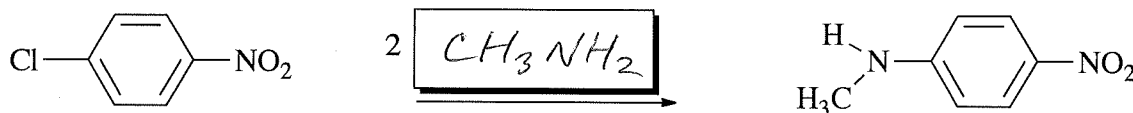
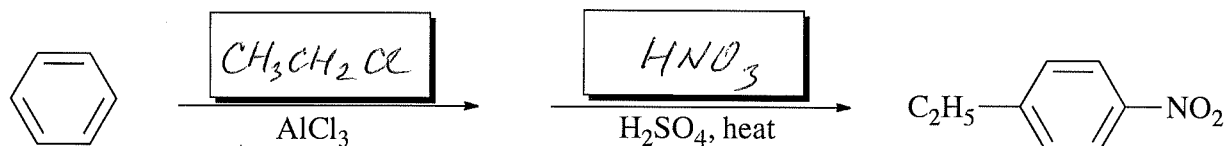
p-ethylbenzoic acid

***m*-chlorobenzoic acid**

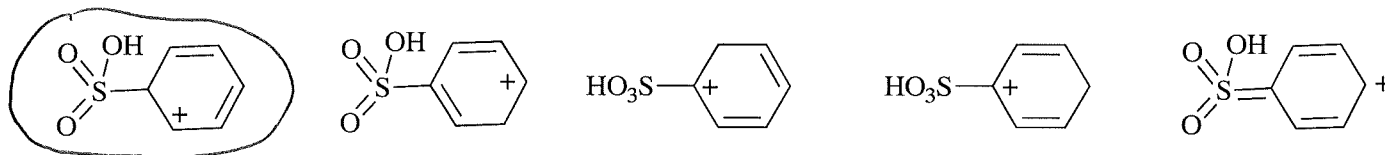
p-chlorobenzoic acid

m-ethylbenzoic acid

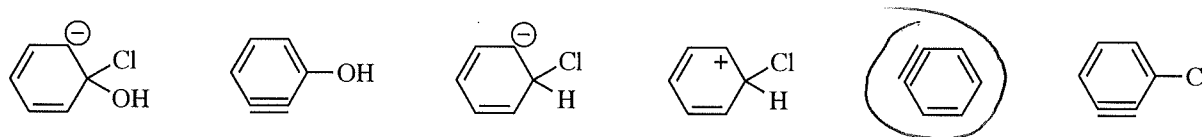
3. (6) Show the reagents that are required to convert the reactant to the indicated product (2 pts each):



4. (3) Circle the structure of the **intermediate** in the reaction of benzene with SO_3 and H_2SO_4 :



5. (3) Circle the structure of the **intermediate** in the reaction of chlorobenzene with $\text{NaOH}/\text{H}_2\text{O}$ at 300°C and high pressure:



Overall Score: 25