Synthesis Practice Questions

Some of the following can be accomplished in one step, some need several steps. You might have to convert part of the starting material into one substance, and another part into another substance, and react the two together, or react other reaction products together.

1) Give essential conditions and reagents to show how you could convert the first substance into the second.
   a) $CH_3CH_2CH_2OH$ to $CH_3CH{=}CH_2$
   b) C_2H_6 to C_2H_5OH
   c) C_2H_6 to $C_2H_5NH_2$

1) With C_2H_5OH as your only organic starting material give reaction schemes to show how you could make.
   a) C_2H_5I
   b) $(C_2H_5)_2O$
   c) $C_2H_5NH_2$,
   d) $CH_3CH_2CH_2NH_2$
   e) CH_3COOH
   f) $C_2H_5CO_2C_2H_5$

2) Starting from benzene or methylbenzene, give reaction schemes to show how you could make:
   a) $C_6H_5CO_2H$
   b) $C_6H_5CH_2CO_2H$
   c) $C_6H_5CH(OH)CH_3$
   d) $C_6H_5CH_2CH_2NH_2$.

3) Give essential reagents and conditions to show how you could make from propene:
   a) CH_3CBrCH_2
   b) $(CH_3)_2CHCO_2H$
   c) $(CH_3)_2CHCH_2NH_2$
   d) $(CH_3)_2CHOCOCH_3$

4) How would you convert methanol into ethanol?

5) Give reaction schemes to show how you could make from chloroethane and any inorganic materials you need.
   a) CH_3CHO
   b) $CH_3CO_2C_2H_5$
   c) $CH_3CH_2CO_2C_2H_5$
   d) $CH_3CH_2CH_2NH_2$
   e) $(CH_3)_2CC_6H_5$ (Use benzene as well.)

6) Devise syntheses for the following compounds, using no organic compounds other than those stated. State the reagents and conditions needed for each step in the synthesis:
   a) (chloromethyl)benzene from benzene and chloromethane.
   b) nitrobenzene from benzene
   c) benzenecarboxylic acid (benzoic acid) from benzene and methane.