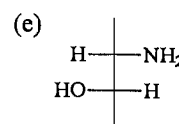
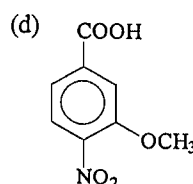
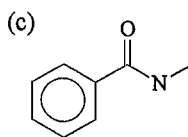
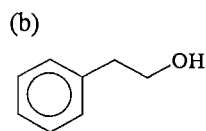
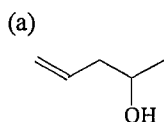


1. Give the IUPAC name for each of the following compound: (15%)



2. Draw the structure for each of the following compound. (15%)

(a) Isobutylcyclopentane

(b) *trans*-2-Methylcyclopentanol

(c) 3-Hydroxybutanal

(d) Acetone cyanohydrin

(e) Bisphenol A

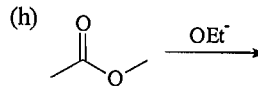
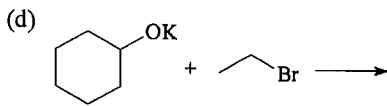
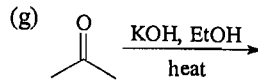
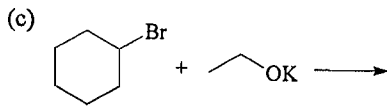
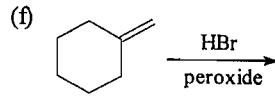
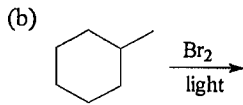
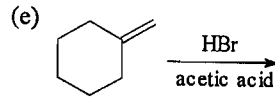
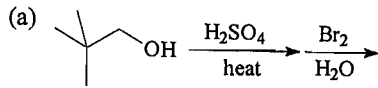
3. For the all C₄ alkanes: butane, isobutane, and cyclobutane, order the (a) boiling point; and (b) heat of combustion? (Ex. butane > isobutane > cyclobutane) (6%)

4. For the primary, secondary, and tertiary carbons, order (a) the stability of the carbocation; and (b) the bond dissociation energy (BDE) of C-H bond. (6%)

5. Order the acidity of the following compounds: (a) ethane, ethylene, and acetylene; (b) benzoic acid, phenol, and *o*-nitrophenol. (6%)

6. Write the structure of the (a) conjugated acid; and (b) conjugated base of methanol. (6%)

7. Draw the structure of the main organic product for each of the following reaction. (24%)



8. Draw the structures of the monomer and polymer of (a) poly(methyl methacrylate); and (b) poly(lactic acid). (10%)

9. Write the reactions of the initiation, propagating, and termination steps for the free-radical polymerization of ethylene. (12%)