Answers to Synthesis Problems

(a)

$$\xrightarrow{\text{HBr}}$$

$$\xrightarrow[\text{EtOH}]{\text{NaOEt}}$$

(b)

$$\xrightarrow[\text{(ii) NaHSO}_3 / \text{H}_2\text{O}]{\text{(i) OsO}_4}$$

$$\xrightarrow{\text{HBr}}$$

(c)

$$\xrightarrow[\text{H}_2\text{O}]{\text{Br}_2}$$

(d)

$$\xrightarrow[\text{h}\upsilon]{\text{NBS}}$$

$$\xrightarrow[\text{EtOH}]{\text{NaOEt}}$$

(e)

$$\xrightarrow[\text{h}\upsilon]{\text{NBS}}$$

$$\xrightarrow{\text{HBr}}$$

+

(f)

$$\xrightarrow[\text{NH}_3 \text{ (liq)}]{\text{Na}}$$

$$\xrightarrow[\text{(ii) NaHSO}_3 / \text{H}_2\text{O}]{\text{(i) OsO}_4}$$

+

(g)

$$\xrightarrow[\text{Lindlar cat.}]{\text{H}_2}$$

$$\xrightarrow[\text{CCl}_4]{\text{Br}_2}$$

+

(h)

Na

NH$_3$ (liq)

Br$_2$

CCl$_4$

Br

Br

(i)

Na

NH$_3$ (liq)

Br$_2$

CCl$_4$

Br

Br

NaOEt

EtOH

(j)

H$_2$

Lindlar cat.

HBr

Br

(k)

Br$_2$

hυ

Br

NaOt-Bu

t-BuOH

(l)

Br$_2$

hυ

Br

NaOEt

EtOH

H$_2$O

H$_2$SO$_4$ cat.
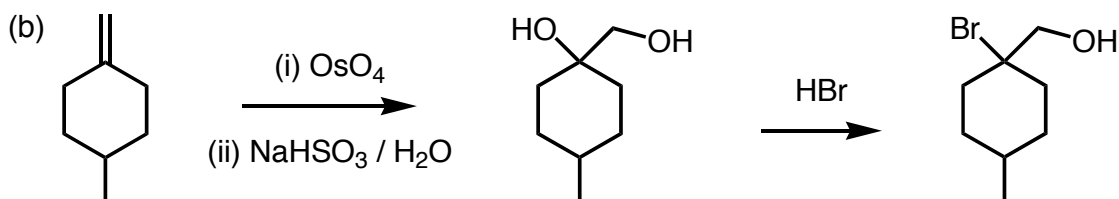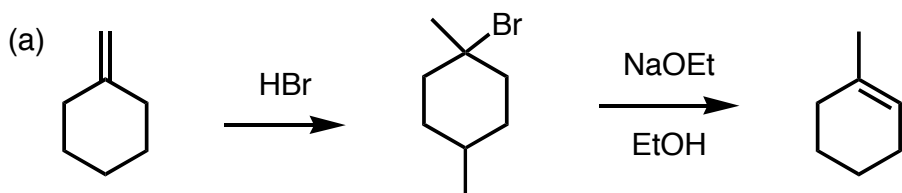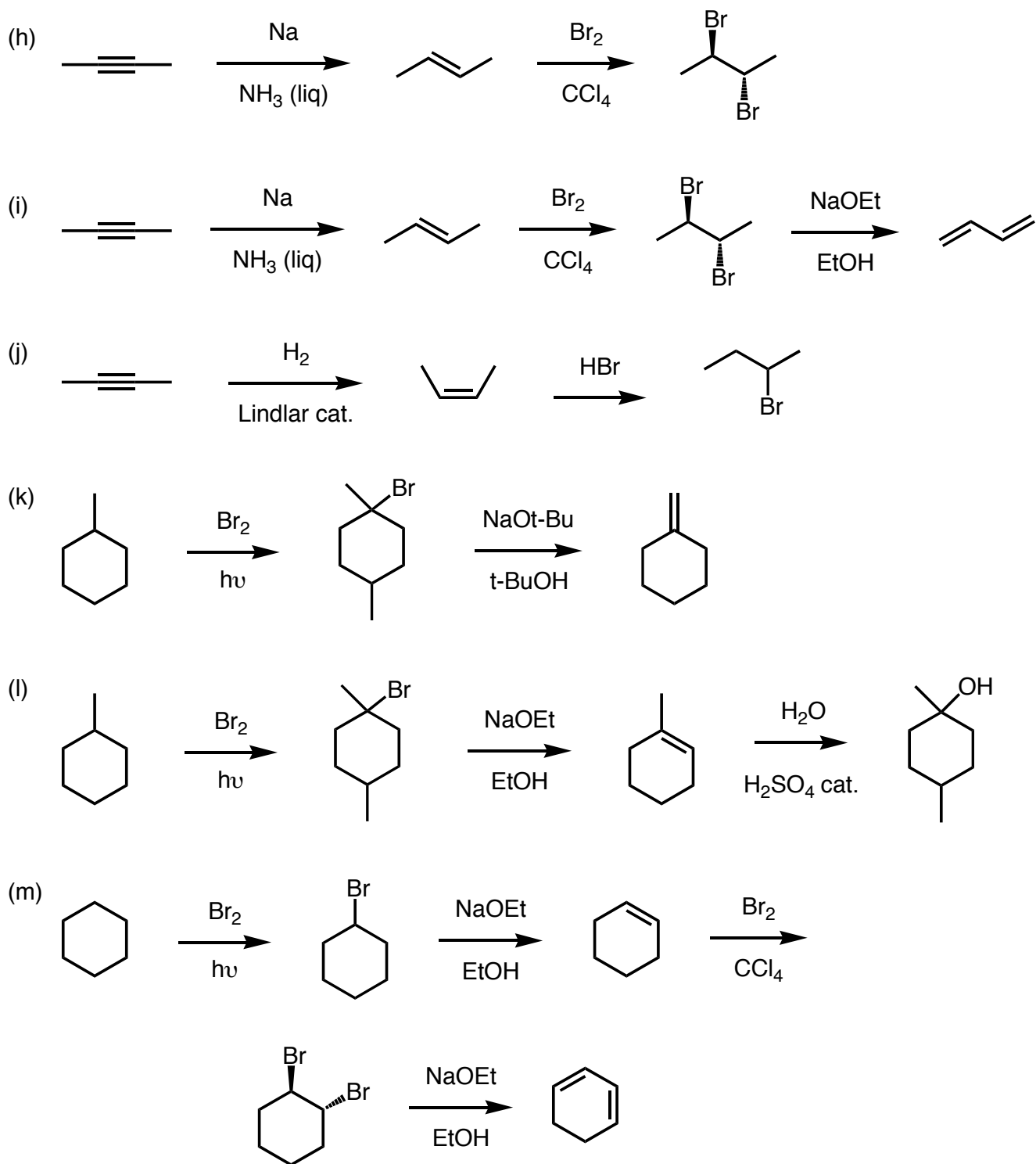
OH

(m)

Br$_2$

hυ

Br

NaOEt

EtOH

Br$_2$

CCl$_4$

Br

Br

NaOEt

EtOH
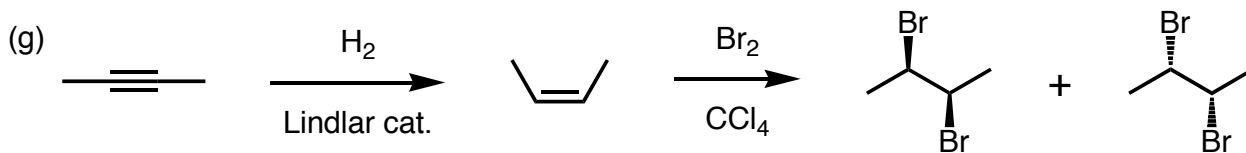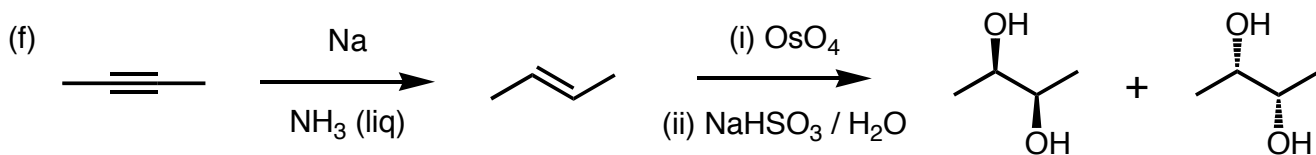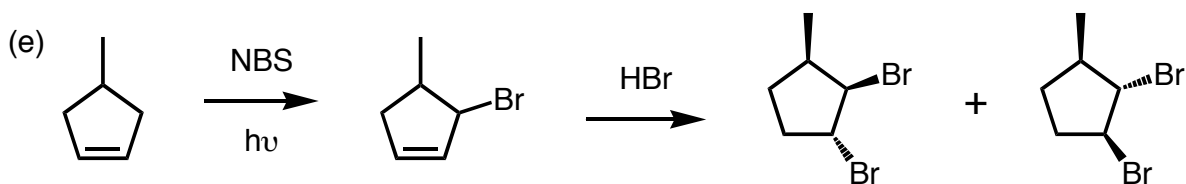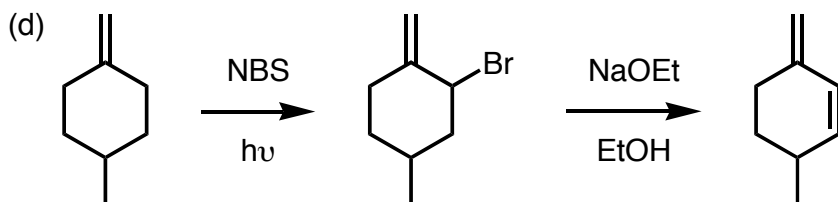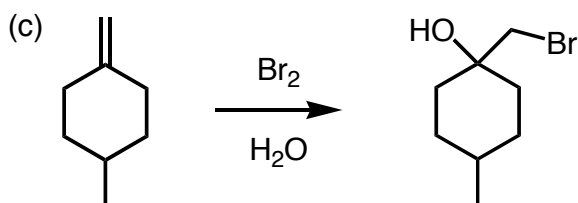
Note: there may be more than one right answer for each of these problems, so if your synthesis is not exactly the same as those written here, it does not necessarily mean that your answer is incorrect... but you should double check with me or a TA...