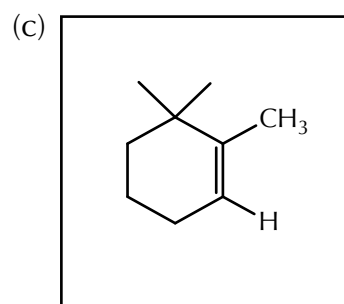
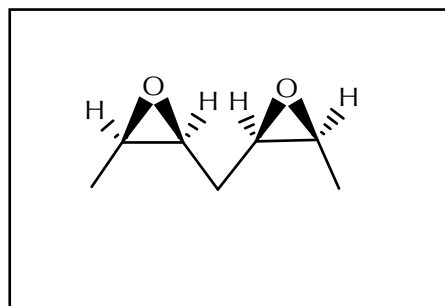
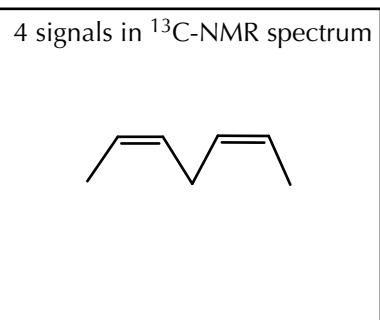
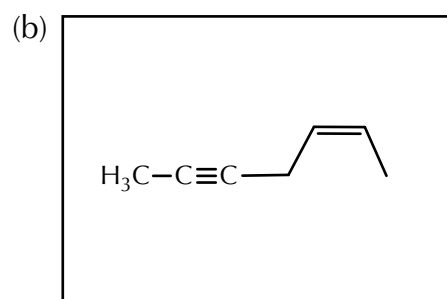
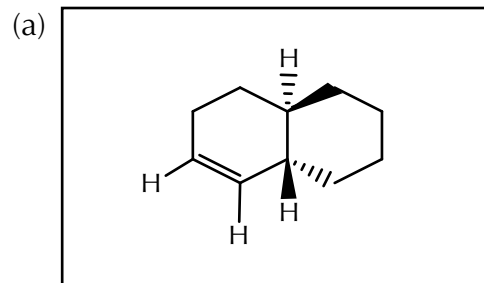
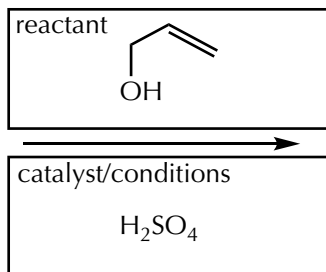
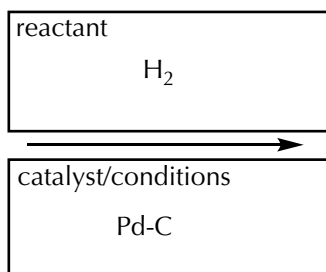


A.

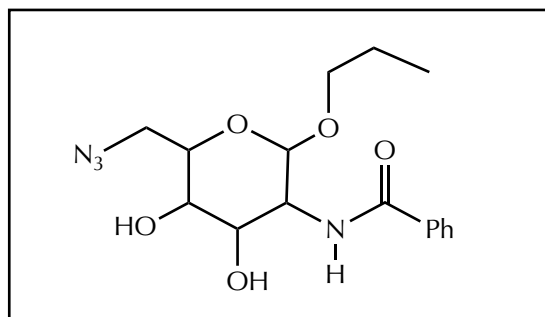
(a)



(b)

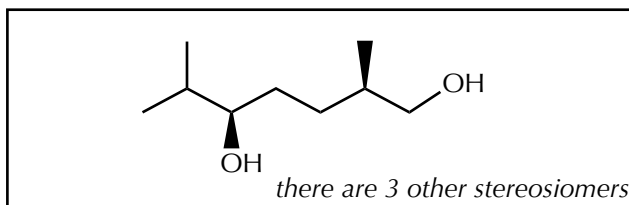


(c)



B.

(a)



(b)

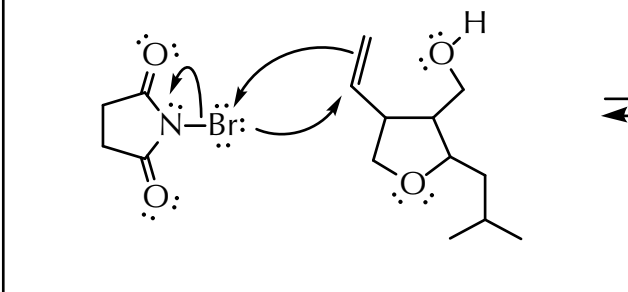
3

(c)

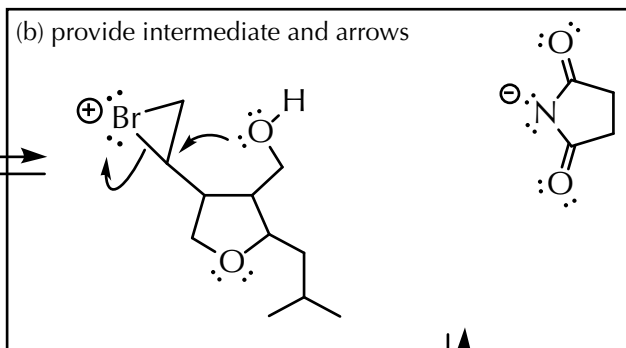
2,6-dimethyl-1,5-heptadiene

A.

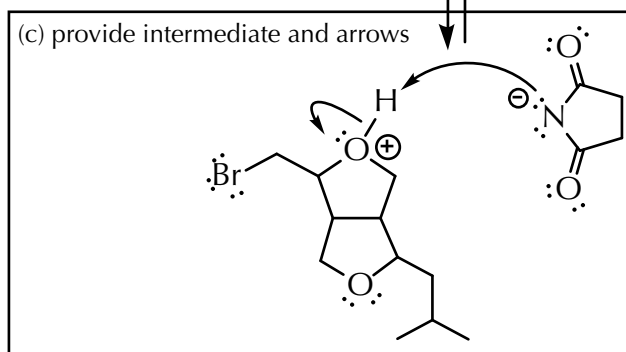
(a) provide arrows



(b) provide intermediate and arrows

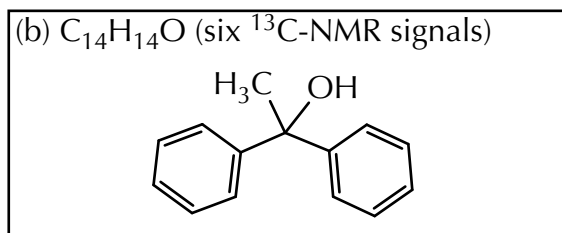


(c) provide intermediate and arrows

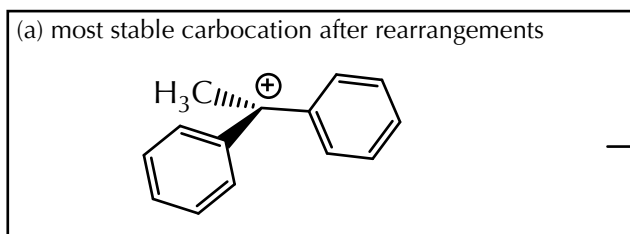


B.

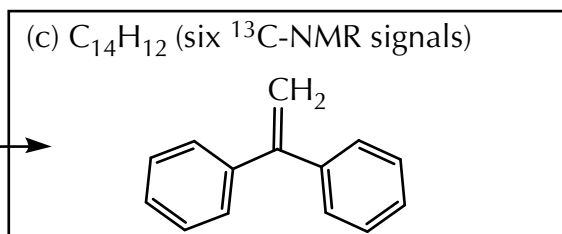
(b) $C_{14}H_{14}O$ (six ^{13}C -NMR signals)



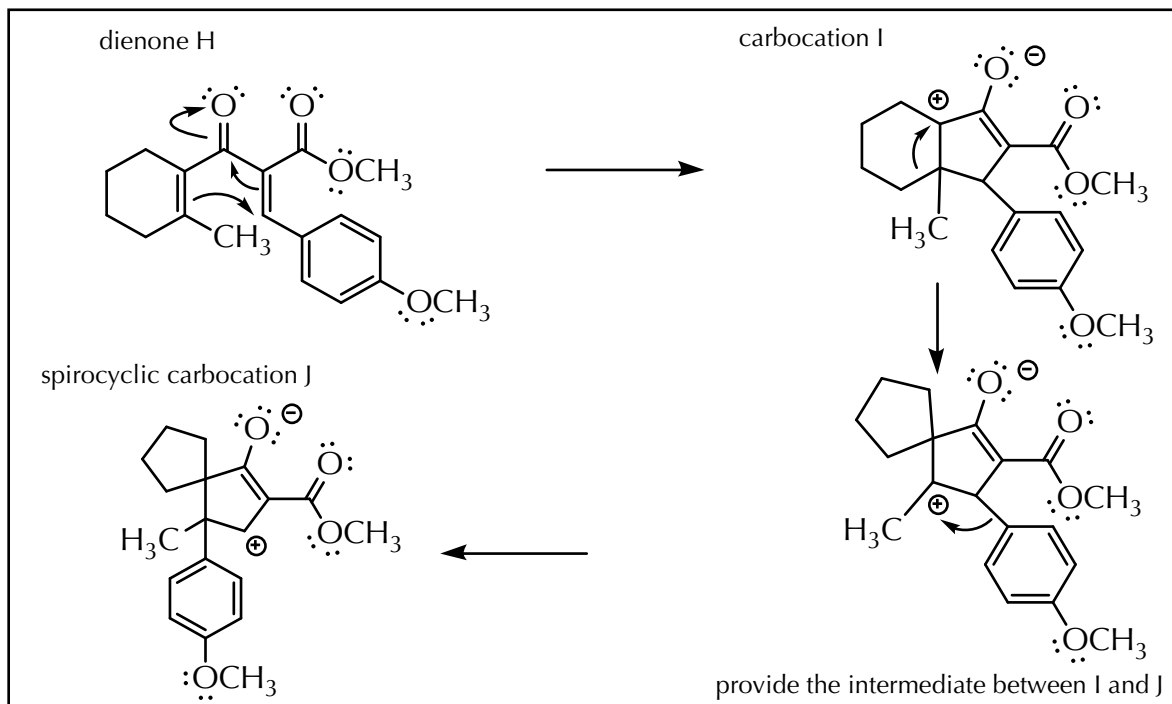
(a) most stable carbocation after rearrangements



(c) $C_{14}H_{12}$ (six ^{13}C -NMR signals)

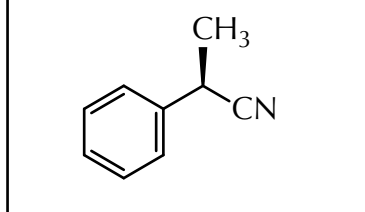


A.



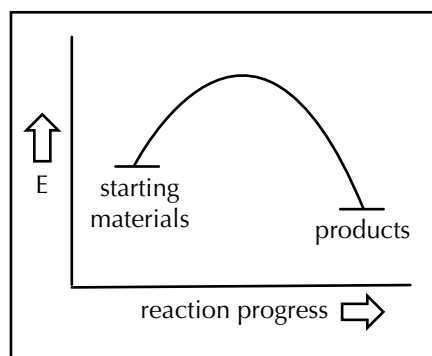
B.

(i) draw the organic product



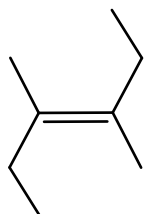
(ii) both

(iii)



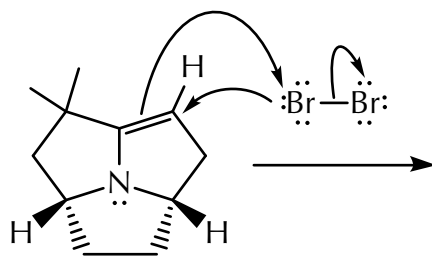
A.

compound Q (C_8H_{16})



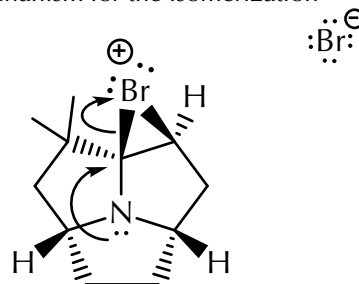
B.

(a) reaction mechanism



compound K

intermediate, with stereochemistry, plus the mechanism for the isomerization



intermediate L

(b) $C_{11}H_{16}BrN$

