Multiple Choice. Select the best answer for the following.

1. What would be the major product of the following reaction?
2. Which of the following carbocations would you expect to be most stable?

A) 

B) 

C) 

D) 

E) 

3. Which of the following would you expect to react fastest in an SN1 reaction? (consider the mechanism)

A) 

B) 

C) 

D) All would react rapidly.

E) None would react.
4. Which of the following would you expect to be aromatic?

A) 

B) 

C) 

D) 

E)
5. What product(s) would you expect the following radical reaction to provide in reasonable yields?

![Chemical Structure](image)

A) ![Structure A](image)
B) ![Structure B](image)
C) ![Structure C](image)
D) both B and C
E) both A and C

6. What reagent(s) would be required to accomplish the following reaction?

![Chemical Structure](image)

A) CH₃CH₂C(=O)Cl, AlCl₃
B) CH₃CH₂CH₂Cl, AlCl₃
C) reagents in A, followed by H₂NNH₂, KOH, Δ
D) reagents in B followed by zinc and HCl
E) CH₃CH=CH₂, H₂SO₄
7. The best **experimental** proof of aromaticity is
   A) A pleasant odor
   B) Infrared CH absorption frequency
   C) NMR chemical shifts
   D) Presence of resonance structures
   E) Presence of conjugation

8. Predict the MAJOR product of the following reaction:

   ![Reaction Diagram]

   A) 
   B) 
   C) 
   D) 
   E) No reaction
9. What would be the product of the following reaction?

\[
\text{CH}_2=\text{C}≡\text{C}≡\text{H} \quad \text{1. BH}_3\cdot \text{THF} \quad \text{2. HO}_2\cdot \text{NaOH} \quad ?
\]

- A) 

\[
\text{CH}_2=\text{C}≡\text{C}≡\text{H}
\]

- B) 

\[
\text{CH}_2=\text{C}≡\text{C}≡\text{OH}
\]

- C) 

\[
\text{CH}_2=\text{C}≡\text{C}=\text{H}
\]

- D) 

\[
\text{CH}_2=\text{C}=\text{CH}_2
\]

- E) 

\[
\text{CH}_2=\text{C}≡\text{CH}_3
\]

10. Which of the following represents the HOMO of butadiene?

- A) 

\[
\text{\text{HOMO}}
\]

- B) 

\[
\text{\text{HOMO}}
\]

- C) 

\[
\text{\text{HOMO}}
\]

- D) 

\[
\text{\text{HOMO}}
\]

- E) None of these.