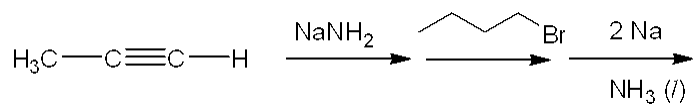


### Exam #3 Chem 2410

#### Multiple Choice

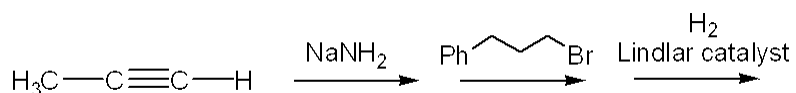
Identify the choice that best completes the statement or answers the question.

1. What is the major organic product obtained from the following series of reactions?



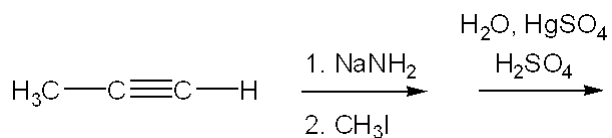
- (Z)-2-heptene
- (E)-2-heptene
- 1-heptene
- heptane

2. What is the major organic product obtained from the following series of reactions?



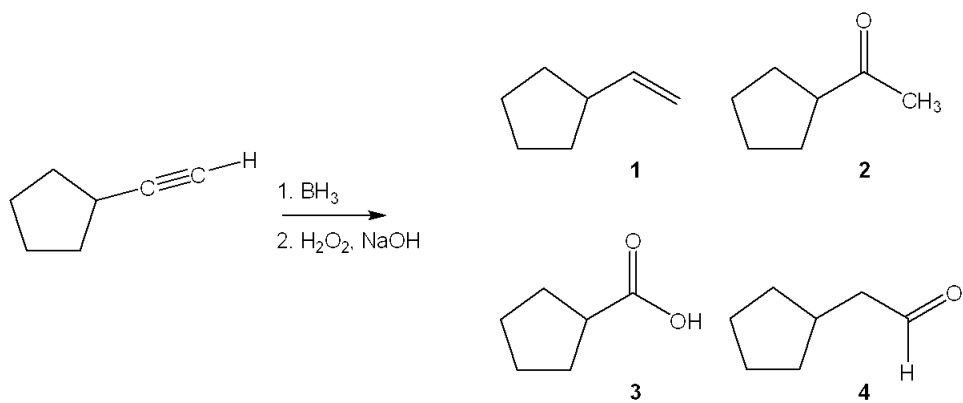
- (E)-5-phenyl-2-pentene
- (Z)-6-phenyl-1-hexene
- (Z)-6-phenyl-2-hexene
- (Z)-6-methyl-3-heptene

3. What is the major organic product obtained from the following series of reactions?



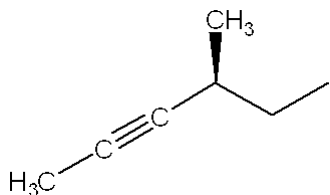
- Propanal
- Propan-1-ol
- Butanal
- 2-Butanone
- Propanone

4. What is the major organic product obtained from the following reaction?



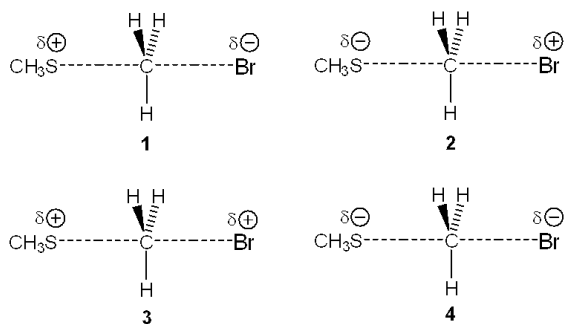
- 1**
- 2**
- 3**
- 4**

5. What is the IUPAC name of the following compound?



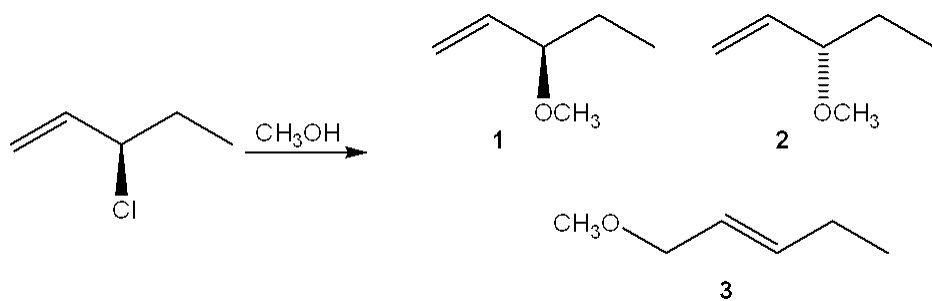
- (*R*)-4-methyl-2-hexyne
- (*S*)-4-methyl-2-hexyne
- (*R*)-3-methyl-2-hexyne
- (*S*)-3-methyl-2-hexyne

6. Which of the following represents the transition state of the reaction between methyl bromide and sodium methylthiolate,  $\text{Na}^+\text{SCH}_3$ ?



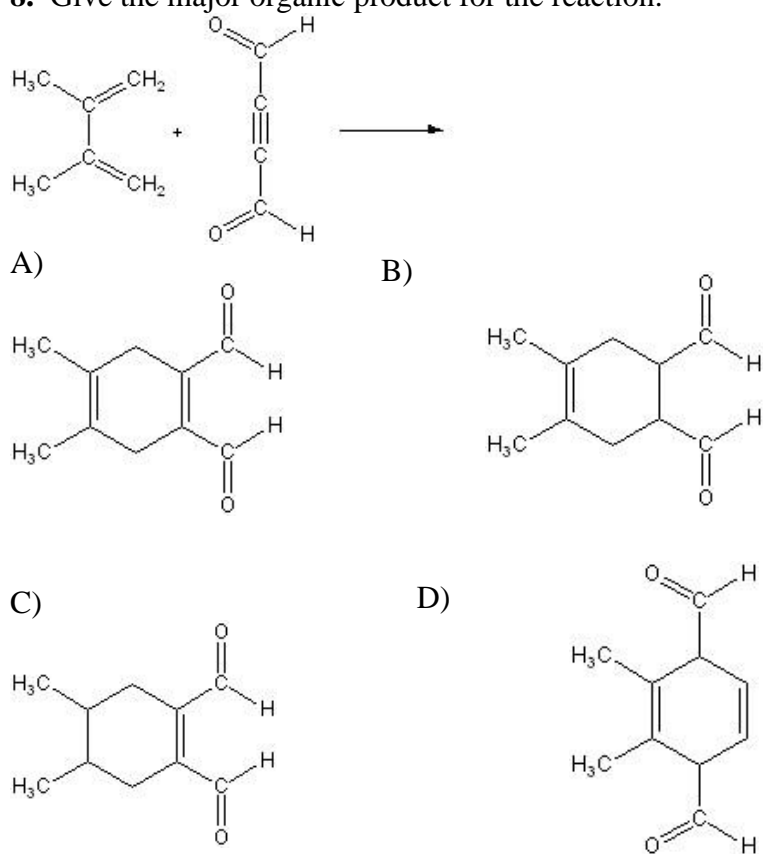
- 1**
- 2**
- 3**
- 4**

7. What is(are) the major organic product(s) obtained from the following S<sub>N</sub>1 substitution reaction?



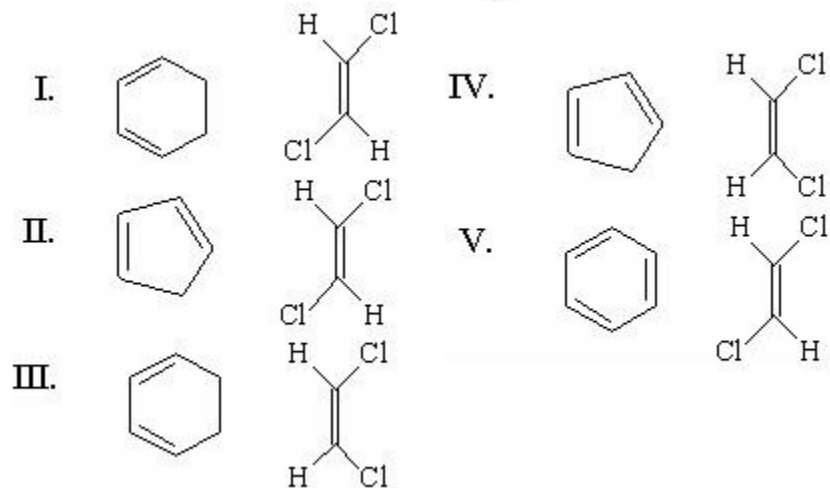
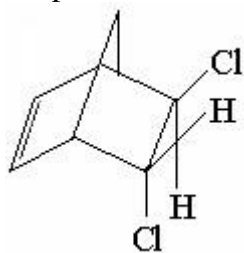
- only 1
- only 2
- only 1 and 2
- 1, 2 and 3

8. Give the major organic product for the reaction.



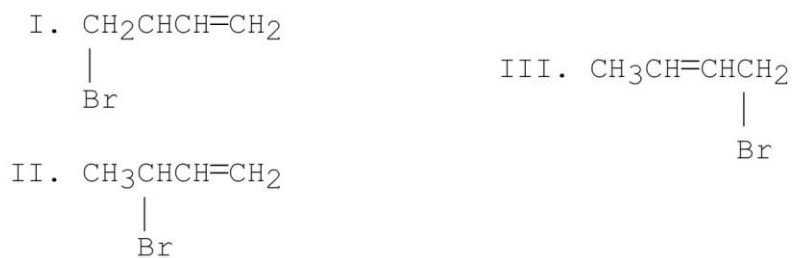
E) no reaction

9. What diene and what dienophile would be used to synthesize the following compound?



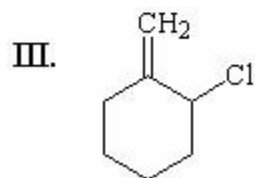
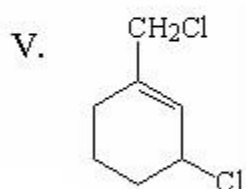
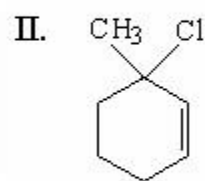
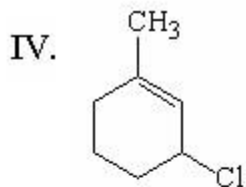
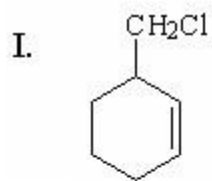
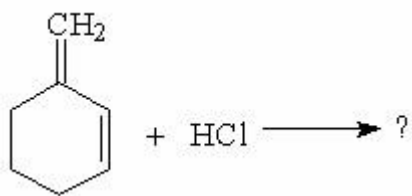
- A) I  
B) II  
C) III  
D) IV  
E) V

10. What is/are the product(s) from the following reaction?



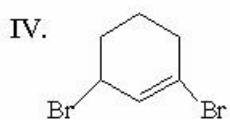
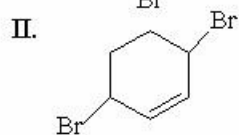
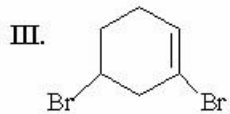
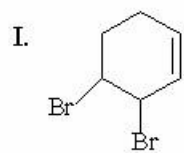
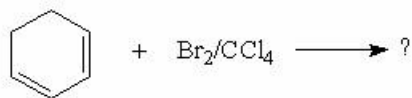
- A) II Minor, III Major  
B) II Major, III Minor  
C) III only  
D) I and II  
E) II and III

11. What is the thermodynamic product for the following reaction?



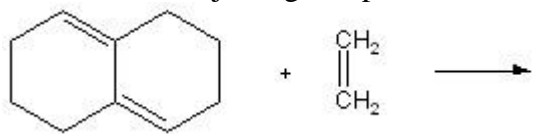
- A) I  
B) II  
C) III  
D) IV  
E) V

12. What are the product(s) from the following reaction? (Both Kinetic and Thermodynamic)

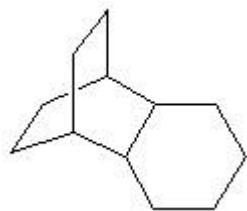


- A) I and II  
B) I and III  
C) I and IV  
D) II and III  
E) II and IV

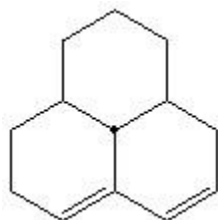
13. Give the major organic product for the reaction.



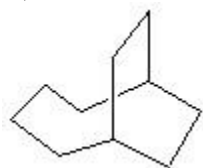
A)



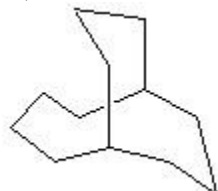
B)



C)

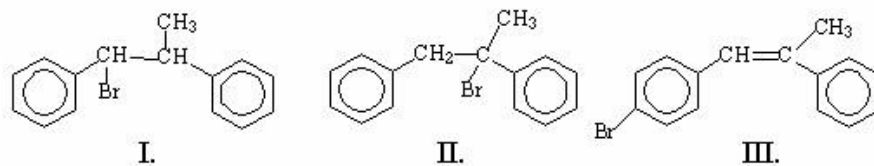
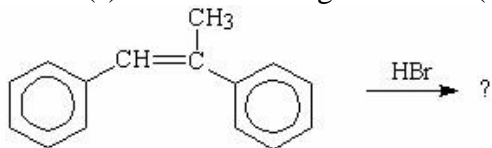


D)



E) no reaction

14. Which of the following is the major product(s) of the following reaction? (Hint: Only one major product)



A) I

B) I and III

C) II

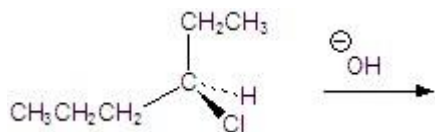
D) II and III

E) III

15. A 1,2-methyl shift occurs when which of the following iodides is heated in ethanol (solvolysis)?

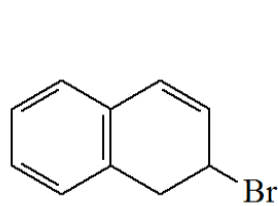
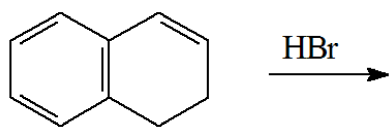
- A)  $\text{C}_6\text{H}_5\text{CHICH}(\text{CH}_3)_2$
- B)  $(\text{CH}_3)_2\text{CHCHICH}_3$
- C)  $(\text{CH}_3)_3\text{CCH}_2\text{CH}_2\text{I}$
- D)  $(\text{CH}_3)_2\text{C}=\text{CHI}$
- E)  $(\text{CH}_3)_3\text{CCHICH}_2\text{CH}_3$

16. Give the name(s) of the product(s) for the following  $\text{S}_{\text{N}}2$  reaction.

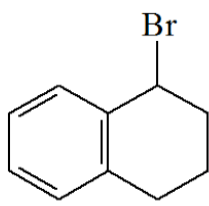


- A) (S)-2-hexanol
- B) (R)-2-hexanol
- C) (S)-3-hexanol
- D) (R)-3-hexanol
- E) (R,S)-3-hexanol

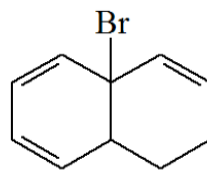
17. Predict the major organic product(s) in the following reaction.



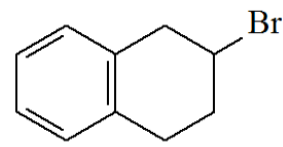
A)



B)



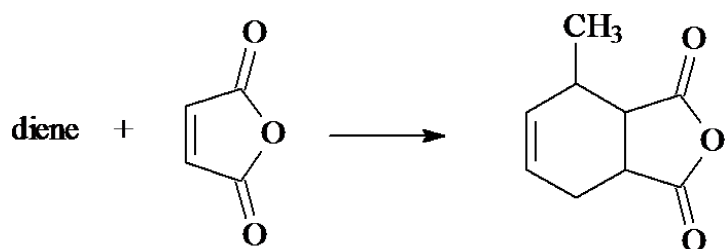
C)



D)

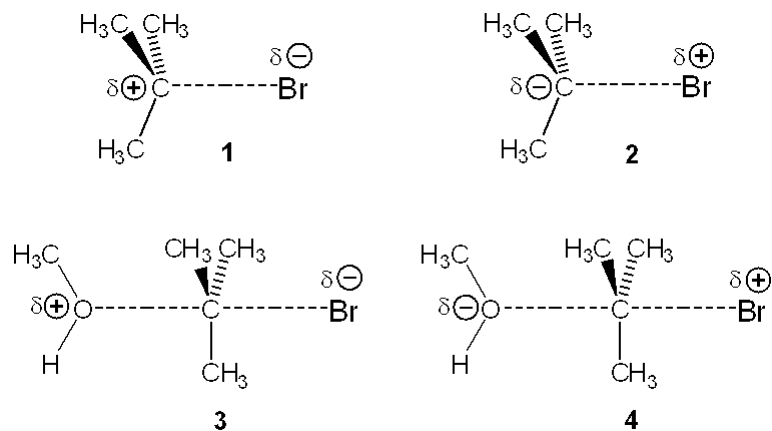
- A. A
- B. B
- C. C
- D. D
- E. A & C

18. Identify the diene needed for the following reaction.



- A. 1,3-pentadiene
- B. 1,4-pentadiene
- C. 2-methyl-1,3-butadiene
- D. 1-methyl-1,3-cyclohexadiene
- E. cyclopentadiene

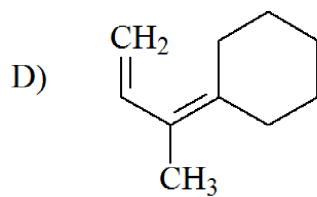
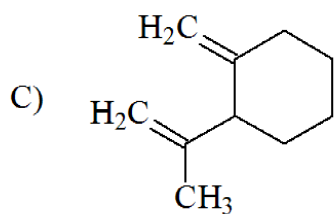
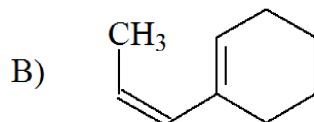
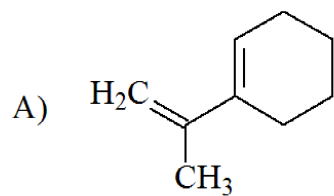
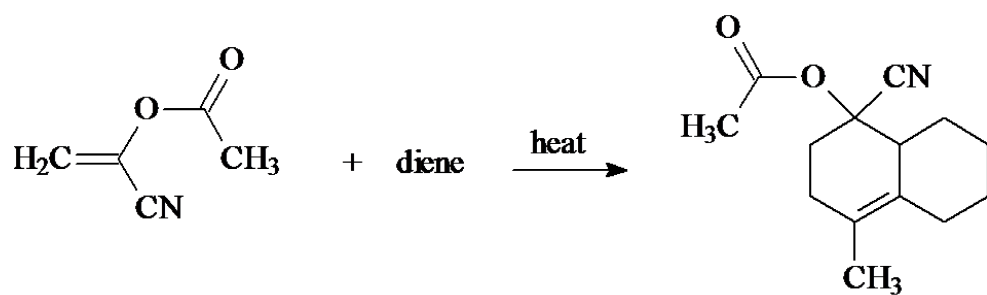
19. Which of the following represents the transition state of the rate-determining step in the reaction between *tert*-butyl bromide and methanol? (Hint: The reaction is an  $S_N1$ )



- a. 1
- b. 2
- c. 3
- d. 4
- e. 1 & 2



20. Identify the diene used in the reaction shown below.



- A. A
- B. B
- C. C
- D. D

**Exam #3 Chem 2410**  
**Answer Section**

**MULTIPLE CHOICE**

1. B
2. C
3. D
4. D
5. B
6. D
7. D
8. A
9. B
10. B
11. D
12. A
13. E
14. C
15. E
16. C
17. B
18. A
19. A
20. A