Chemistry 2541, Fall 2017
Midterm Exam 3

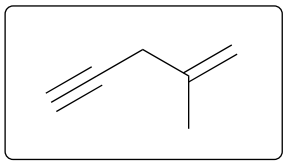
(100 points)

Important notes:

- Please use the provided Scantron form for your answers; you can keep the sheet with the questions and can use it as scratch paper
- Do not forget to write your name on the Scantron form
- You will not receive credit for unmarked answers or for more than one mark on answer line
- Your scores will be posted on eGradebook; graded Scantron forms will not be returned to students.

Questions 1-28 (84 pts): Please mark the appropriate box on the front of the Scantron form (3 pts each).

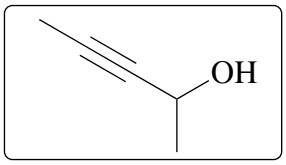
1. What is the **IUPAC name** for the compound shown in the box?



A) (*E*)-2-methyl-5-pentyn-1-ene B) 2-methyl-1-penten-4-yne

C) 2-methyl-1-hexen-4-yne D) 4-methyl-1-hexyn-4-ene

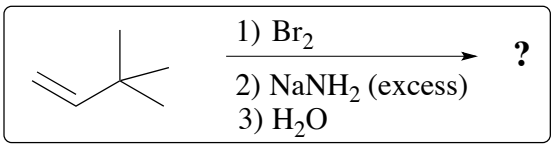
2. What is the **IUPAC name** for the compound shown in the box?



A) 3-pentyn-2-ol B) 2-pentyn-4-ol

C) 2-methyl-3-butynol D) 1-methyl-3-butyn-2-ol

3. What is the **IUPAC name** of the major product for the reaction shown in the box?



A) 4,4-dimethyl-2-pentyne B) 3,3-dimethyl-1-butyne

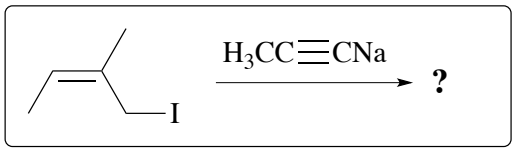
C) 4,4-dimethyl-1-pentyne D) 3,3-dimethyl-1-pentyne

4. A terminal alkyne, 1-butyne is **NOT deprotonated** by the ethoxide ion. What does this indicate?

A) Alkynyl anion is a weaker base than the hydroxide ion B) 1-Butyne is stronger base than ethanol

C) Ethanol is a stronger acid than 1-butyne D) 1-Butyne is the conjugate base of ethanol

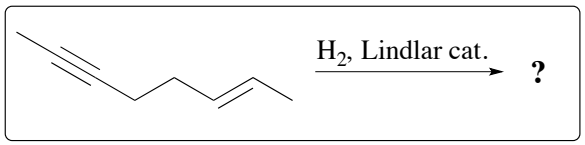
5. What is the **IUPAC name** of the major product for the reaction shown in the box?

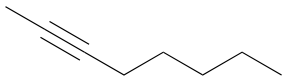


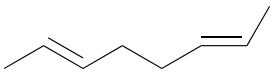
A) 2-methyl-1-hepten-5-yne B) (*E*)-3-methyl-2-hepten-5-yne

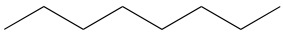
C) 2-methyl-2-heptyne D) (*Z*)-3-methyl-2-hepten-5-yne

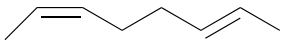
6. What is a main **product** of the reaction shown in the box?



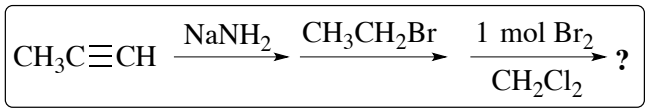
A) 

B) 

C) 

D) 

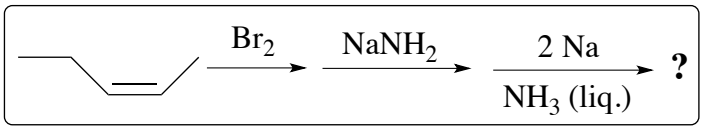
7. What is the **IUPAC name** of the major product for the reaction sequence shown in the box?

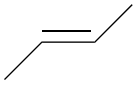


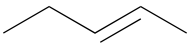
A) (*E*)-2,3-dibromo-2-pentene B) 2,3-dibromopentane

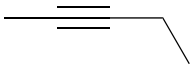
C) (*Z*)-2,3-dibromo-2-pentene D) 3,3-dibromopentane

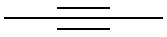
8. What is the main **product** of the reaction shown in the box?



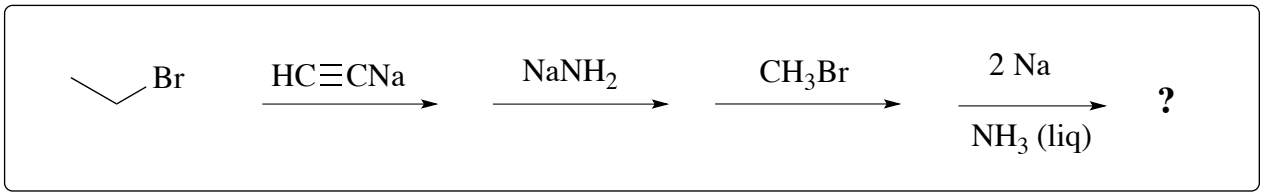
A) 

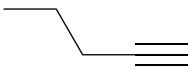
B) 

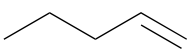
C) 

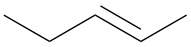
D) 

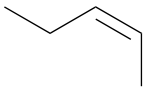
9. What is the main **product** of the reaction sequence shown in the box?



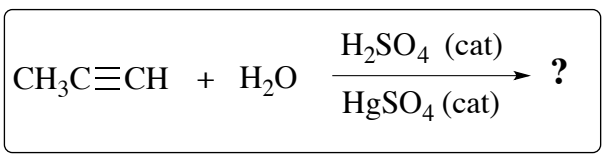
A) 

B) 

C) 

D) 

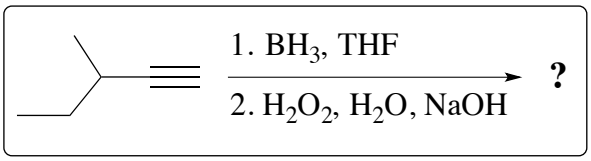
10. What is the main **product** of the reaction shown in the box?

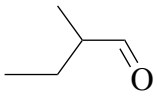


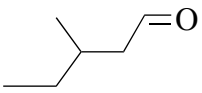
A) $CH_3CH_2CH_2OH$ B) $CH_3CH(OH)CH_3$

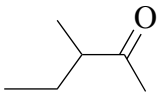
C) CH_3CH_2CHO D) CH_3COCH_3

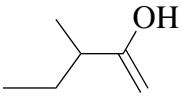
11. What is the main **product** of the reaction shown in the box?



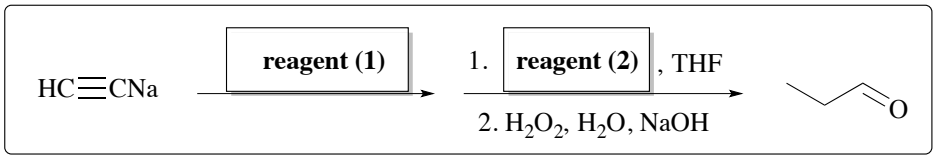
A) 

B) 

C) 

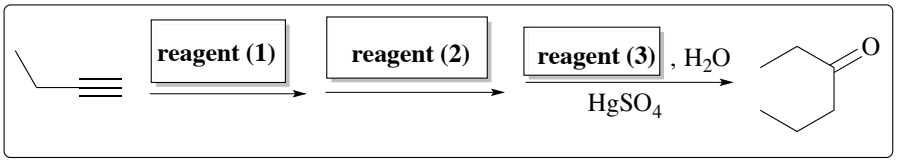
D) 

12. Which **sequence of reagents** can be used for the reaction shown in the box?



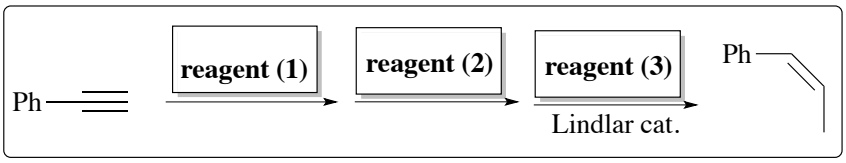
A) (**1**) CH_3Br, (**2**) BH_3
B) (**1**) CH_2CH_3Br, (**2**) BH_3
C) (**1**) CH_3Br, (**2**) H_2SO_4
D) (**1**) CH_2CH_3Br, (**2**) $HgSO_4$

13. Which **sequence of reagents** can be used for the reaction shown in the box?



A) (**1**) NaH, (**2**) C_2H_5Br, (**3**) H_2SO_4
B) (**1**) $NaNH_2$, (**2**) CH_3Br, (**3**) H_2SO_4
C) (**1**) Br_2 (**1**), (**2**) $NaNH_2$, (**3**) BH_3
D) (**1**) $NaNH_2$, (**2**) CH_3Br, (**3**) BH_3

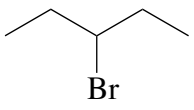
14. Which **sequence of reagents** can be used for the reaction shown in the box?

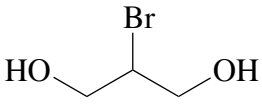


A) (**1**) $NaNH_2$, (**2**) CH_3Br, (**3**) H_2
B) (**1**) CH_3Br, (**2**) NH_3, (**3**) Na
C) (**1**) CH_3CH_2Br, (**2**) $NaNH_2$, (**3**) H_2
D) (**1**) Br_2, (**2**) $NaNH_2$, (**3**) H_2

15. Which one of the following compounds has **high solubility in water**?

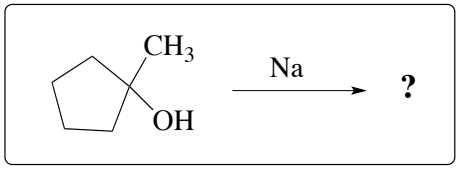
A) $CHBr_3$

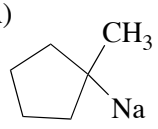
B) 

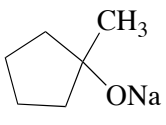
C) 

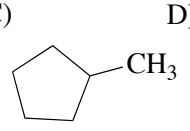
D) 

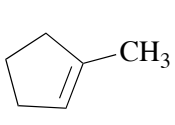
16. What is the main **product** of the reaction shown in the box?



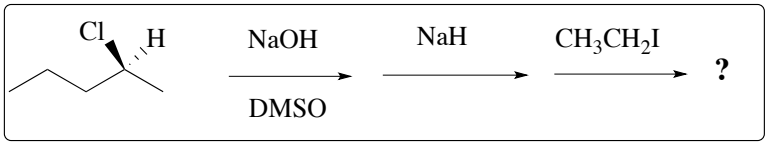
A) 

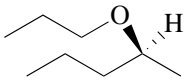
B) 

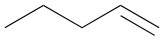
C) 

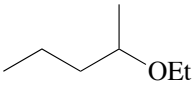
D) 

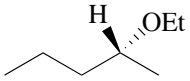
17. What is the main **product** of the reaction shown in the box?



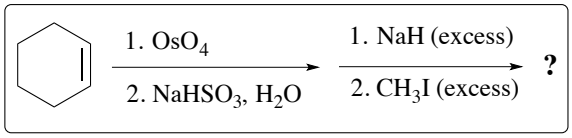
A) 

B) 

C) 

D) 

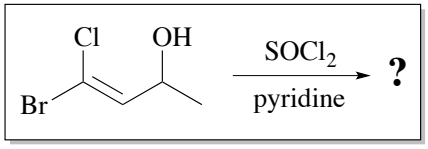
18. What is the **IUPAC name** of the major product for the reaction sequence shown in the box?



A) *cis*-1,2-dimethoxycyclohexane B) *cis*-1,2-dimethylcyclohexane

C) *trans*-1,2-dimethoxycyclohexane D) *trans*-1,2-dimethylcyclohexane

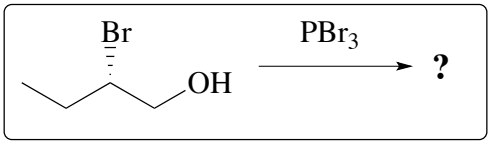
19. What is the **IUPAC name** of the major product for the reaction shown in the box?



A) (*E*)-1-bromo-1,3-dichloro-1-butene B) (*Z*)-1-bromo-1,3-dichloro-1-butene

C) (*E*)-1-bromo-1,3-dichloro-2-butene D) (*Z*)-1-bromo-1,3-dichloro-2-butene

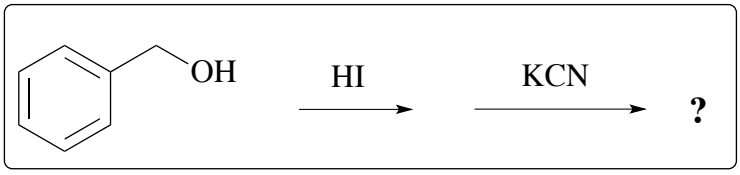
20. What is the **IUPAC name** of the major product for the reaction shown in the box?



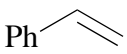
A) (2*S*,3*S*)-2,3-dibromobutane B) (2*R*,3*S*)-2,3-dibromobutane

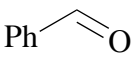
C) (*R*)-1,2-dibromobutane D) (*S*)-1,2-dibromobutane

21. What is the main **product** of the reaction shown in the box?

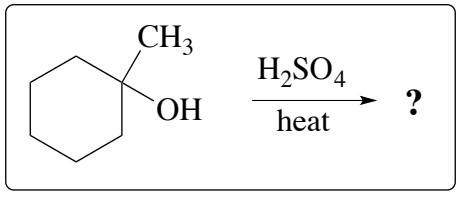


A) $PhCH_2CH_2CN$ B) $PhCH_2CN$

C) 

D) 

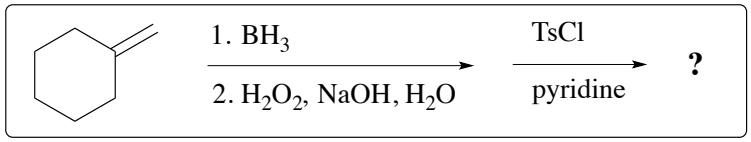
22. What is **the IUPAC name** of the major product for the reaction shown in the box?

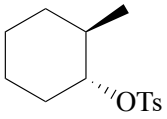


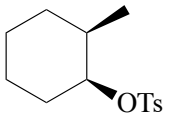
A) 1-methylcyclohexene B) 3-methylcyclohexene

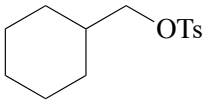
C) 4-methylcyclohexene D) methylenecyclohexene

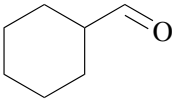
23. What is the main **product** of the reaction shown in the box?



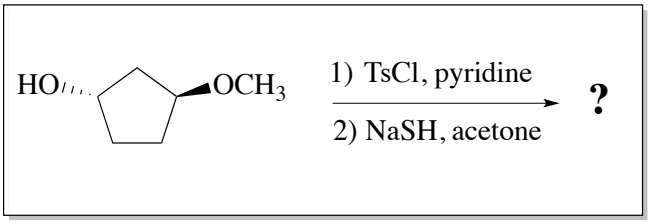
A) 

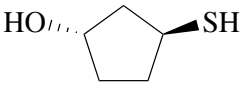
B) 

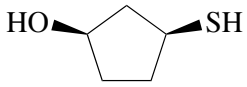
C) 

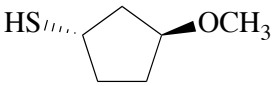
D) 

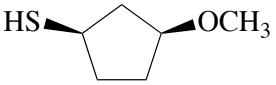
24. What is the main **product** of the reaction shown in the box?



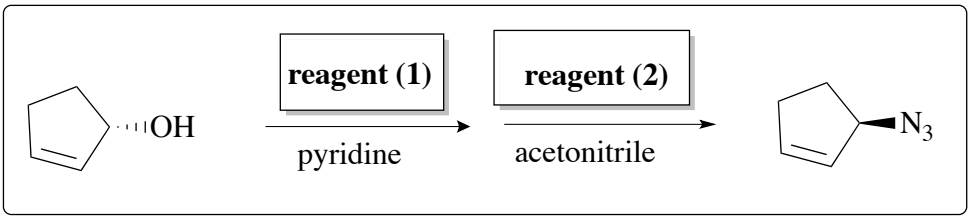
A) 

B) 

C) 

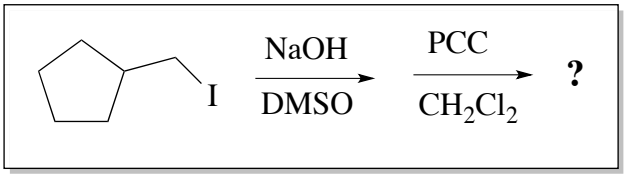
D) 

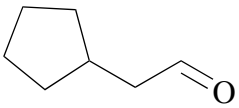
25. Which **sequence of reagents** can be used for the reaction shown in the box?

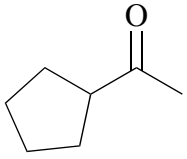


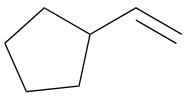
A) (**1**) NaN_3, (**2**) IBX
B) (**1**) IBX, (**2**) NaN_3
C) (**1**) TsCl, (**2**) NaN_3
D) (**1**) NaN_3, (**2**) TsCl

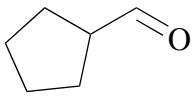
26. What is the main **product** of the reaction sequence shown in the box?



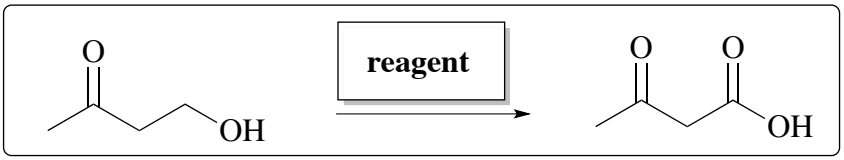
A) 

B) 

C) 

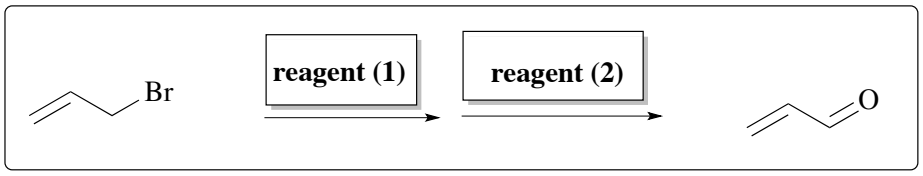
D) 

27. Which **reagent** can be used for the reaction shown in the box?



A) IBX B) H_2CrO_4
C) PCC C) NBS

28. Which **sequence of reagents** can be used for the reaction shown in the box?



A) (**1**) NaOH, (**2**) IBX
B) (**1**) CH_3ONa, (**2**) PCC
C) (**1**) NBS, (**2**) PCC
D) (**1**) NaOH, (**2**) H_2CrO_4

Question 29: Provide the reagents that give the indicated products in high yield. Please write your answers in **boxes 66-69** on the back of the Scantron form (4 pts each).