PICK THE MOST ACCURATE ANSWER FOR EACH QUESTION.

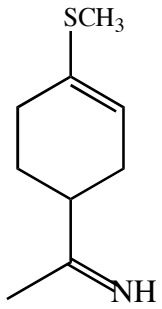
1. What is the least electropositive element among the following?

a) O **b)** Be **c)** B **d)** C E) N

2. Which of the following elements has 6 electrons in the valence (outer) shell?

a) C b) B c) Se d) P E) F

Use molecule Molecule G (below to answer questions 3 and 4 (below).



Molecule H

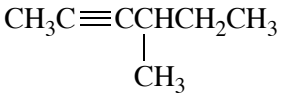
3. What is the hybridization of the nitrogen atom in Molecule H (above)?

A) SP
B) SP^2
C) SP^3
D) SP^4

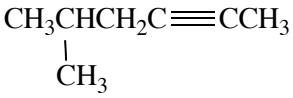
4. What is the molecular formula for molecule H?

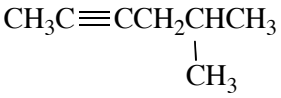
A) $C_8H_{12}SN$
B) $C_8H_{13}SN$
C) $C_8H_{14}SN$
D) $C_9H_{12}SN$
E) $C_9H_{13}SN$
F) $C_9H_{14}SN$
G) $C_9H_{15}SN$
H) $C_9H_{16}SN$
I) $C_9H_{17}SN$

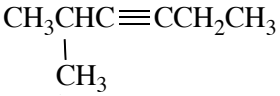
5. Which of the following molecules is 4-methyl-2-hexyne?

a. 

b. 

c. 

d. 

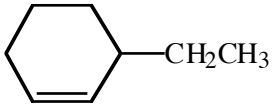
e. 

6. What product(s) will be observed by the addition of one molar equivalent of Br_2 to 1,3-cyclohexadiene?

a) 1,2-dibromocyclohexene **b)** 3,4-dibromocyclohexene c) 1,3-dibromocyclohexene

d) 3,6-dibromocyclohexene **e)** both **b** and **d**

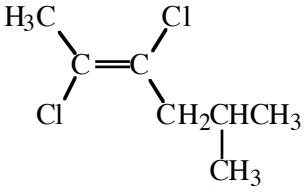
7. What is the correct name for the following molecule?



a) 1-ethylcyclohexene **b)** 2-ethylcyclohexene **c)** 3-ethylcyclohexene

d.) cyclohexylethane **e)** 1-ethyl-3-cyclohexene

8. The correct IUPAC name for the following molecule is:



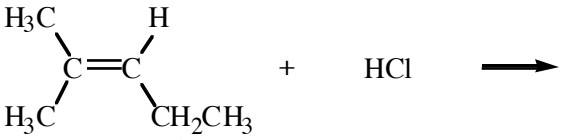
a. *trans*-2,3-dichloro-5-methyl-2-hexene
b. *trans*-2,3-dichloro-5-methyl-3-hexene
c. *cis*-2,3-dichloro-5-methyl-3-hexene
d. *trans*-4,5-dichloro-2-methyl-4-hexene
e. *cis*-4,5-dichloro-2-methyl-4-hexene

9. What product(s) will be observed by the addition of one molar equivalent of Br_2 to 1,3-cyclohexadiene?

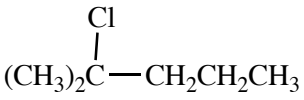
a) 1,2-dibromocyclohexene **b)** 3,4-dibromocyclohexene c) 1,3-dibromocyclohexene

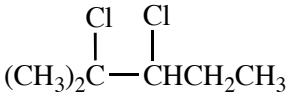
d) 3,6-dibromocyclohexene **e)** both **b** and **d**

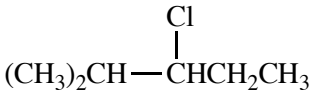
10. The product of the reaction



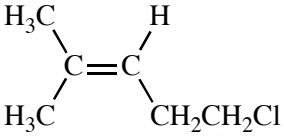
is

a. 

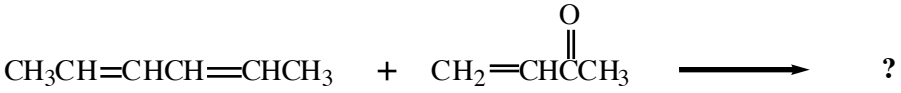
b. 

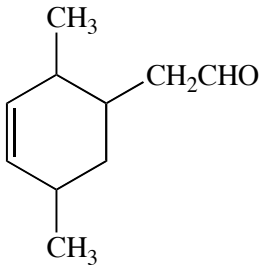
c. 

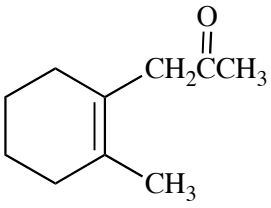
d. 

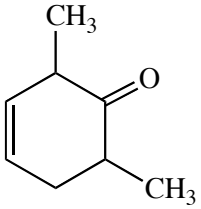
e. 

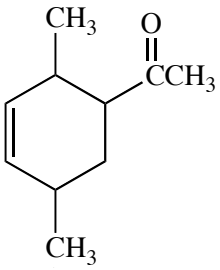
11. The Diels-Alder reaction is very important in the synthesis of six-membered rings. What six-membered ring is produced with the following reaction?

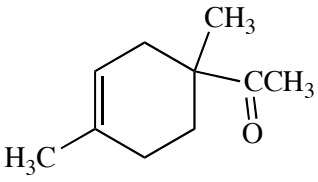


a. 

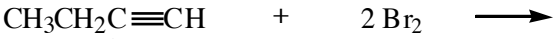
b. 

c. 

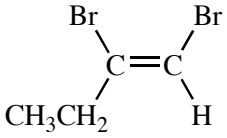
d. 

e. 

12. The product of the reaction

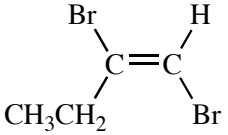


is

a. 

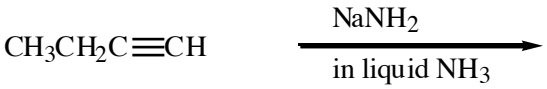
b. $CH_3CH_2CBr_2CH_3$

c. $CH_3CH_2CBr_2CHBr_2$

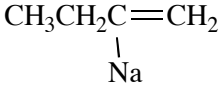
d. 

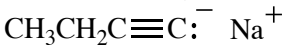
e. $CH_3CH_2CHBrCH_2Br$

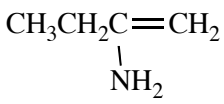
13. The product of the reaction:

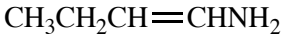


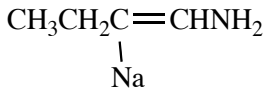
is

a. 

b. 

c. 

d. 

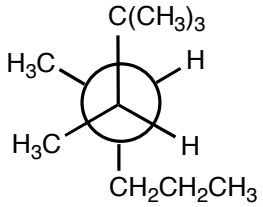
e. 

14. Addition of H_2 to 2-butyne in the presence of the Lindlar's catalyst will produce:

a) butane **b)** 1-butene **c)** *cis*-2-butene

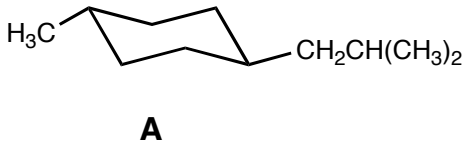
d) *trans*-2-butene **e)** isobutylene

15. Which of the following is the correct name for the Newman Projection below?

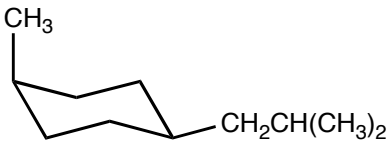


a) 2,3,4-trimethylheptane
b) 2,2,3,4-tetramethylhexane
c) 2,3,4-tetramethylhexane
d) 2,2,3,4-tetramethylheptane

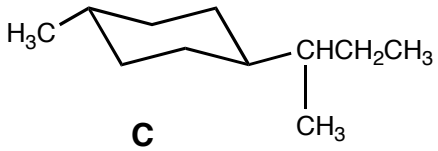
16. Which of the following structures the most stable chair conformation for cis-1-isobutyl-4-methylcyclohexane?



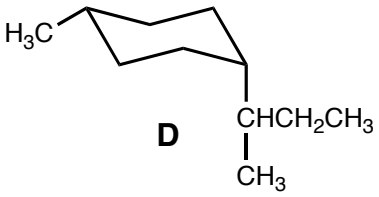
A



B

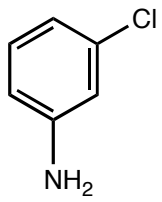


C



D

17. Which of the following is the correct name for **Compound A**?

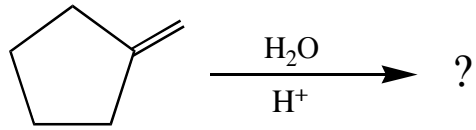


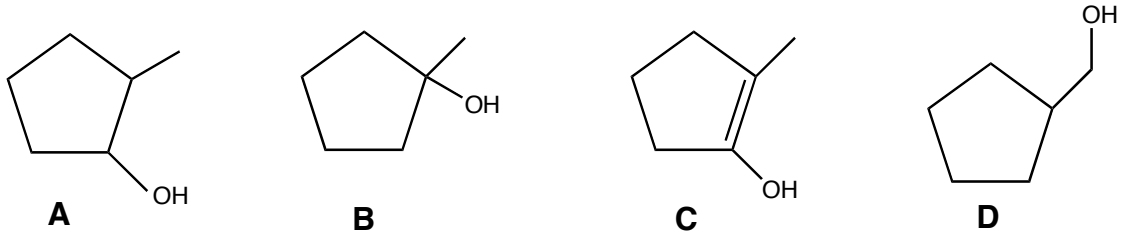
Compound A

a) *meta*-chloroaniline
b) *ortho*-chloroaniline
c) *para*-chloroaniline

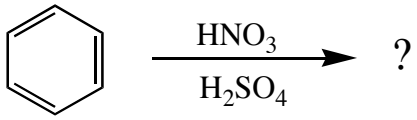
d) *meta*-chloronitrobenzene
e) *ortho* –chloronitrobenzene
f) *para* –chloronitrobenzene

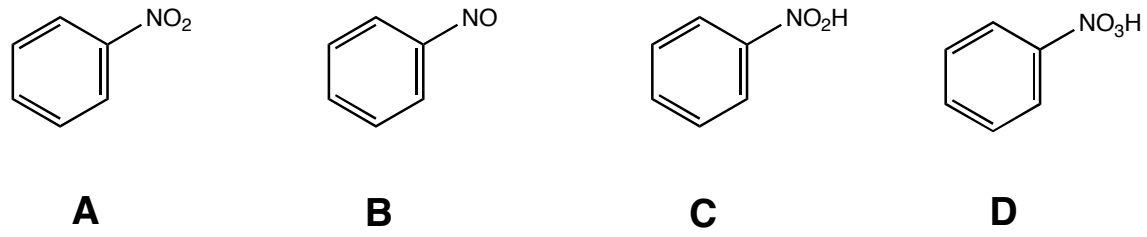
18. Which of the given molecules is the major product of the following reaction?



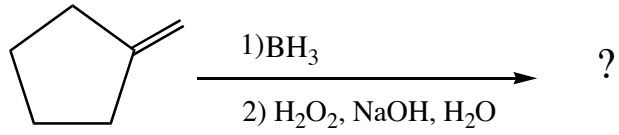


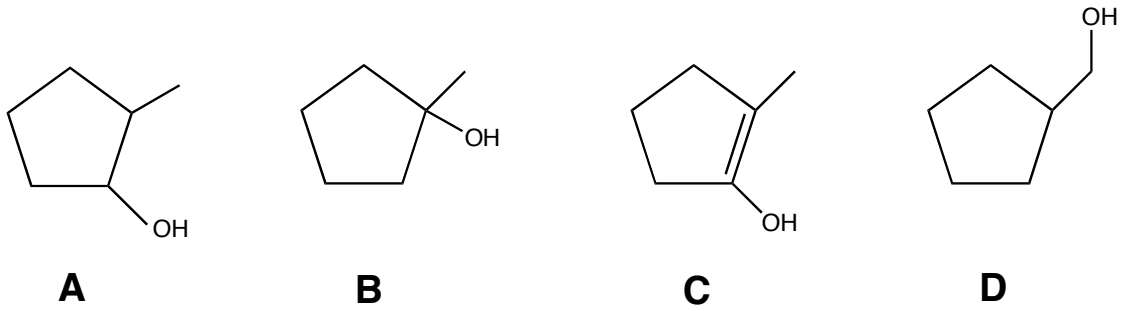
19. Which of the given molecules is the major product of the following reaction?



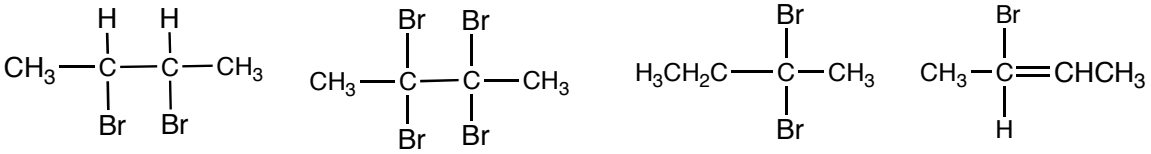


20. Which of the given molecules is the major product of the following reaction?



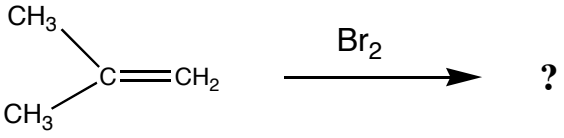


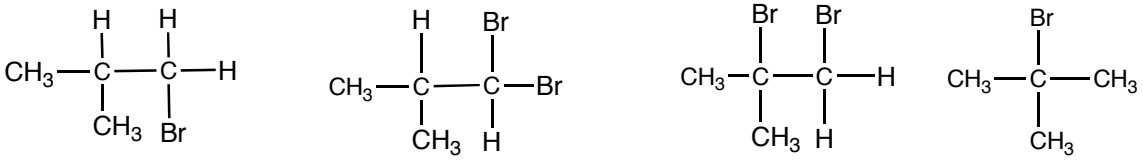
21. Which of the given molecules is the major product of the following reaction?



A **B** **C** **D**

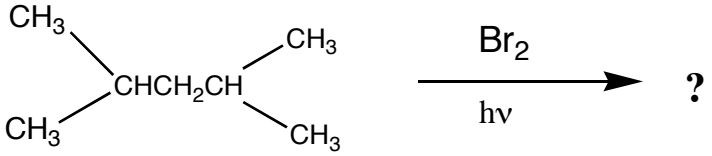
22. Which of the given molecules is the major product of the following reaction?





A **B** **C** **D**

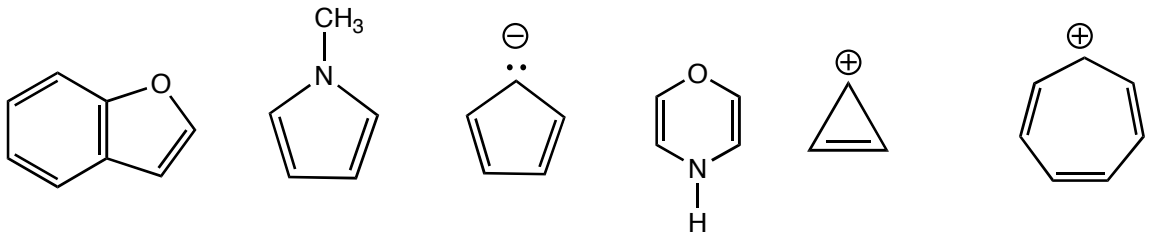
23. How many monobromination products are there in the following reaction?



a) 1 b) 2 c) 3 d) 4

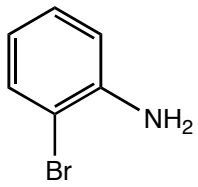
e) 5 f) 6 g) 7 h) 8

24. Which of the following molecules is **NOT** aromatic?



A **B** **C** **D** **E** **F**

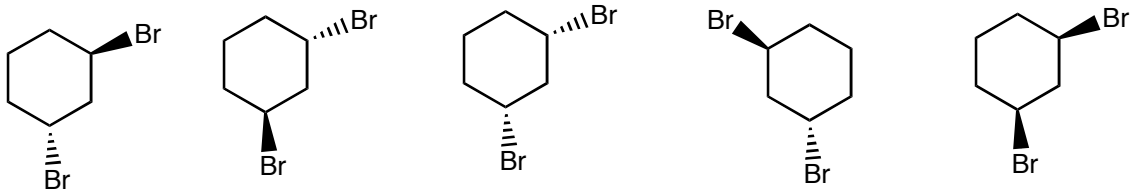
25. Which of the following is the correct name for **Compound Z**?



Compound Z

A) *ortho*-bromonitrobenzene
B) *meta*-bromonitrobenzene
C) *para*-bromonitrobenzene
D) *ortho*-bromoaniline
E) *meta* -bromoaniline
F) *para* -bromoaniline

Use Figure 1 (below) to answer questions 26 through 30.



I **II** **III** **IV** **V**

Figure 1

26. What is the isomeric relationship between compounds **I & II** in **Figure 1**?

A) Diasteriomers
B) Enantiomers
C) Identical
D) Constitutional isomers

27. What is the isomeric relationship between compounds **II & IV** in **Figure 1**?

A) Diasteriomers
B) Enantiomers
C) Identical
D) Constitutional isomers

28. What is the isomeric relationship between compounds **III& IV** in **Figure 1**?

A) Diasteriomers
B) Enantiomers
C) Identical
D) Constitutional isomers

29. What is the isomeric relationship between compounds **III & V** in **Figure 1**?

A) Diasteriomers
B) Enantiomers
C) Identical
D) Constitutional isomers

30. What is the correct IUPAC name for compounds **III** in **Figure 1**?

A) (1S,2S)-1,3-dibromocyclohexane
B) (1R,2S)-1,3-dibromocyclohexane
C) (1S,2S)-1,5-dibromocyclohexane
D) (1R,2R)-1,3-dibromocyclohexane