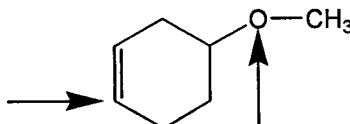


34. On the molecule shown below, what is the hybridization of the labeled carbon and oxygen?



A. C, sp^2 ; O, sp

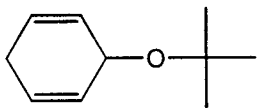
B. C, sp ; O, sp^3

C. C, sp^2 ; O, sp^3

D. C, sp^3 ; O, sp^2

E. None of the above.

35. The chemical formula of the molecule shown below is:



A. $C_{10}H_{14}O$

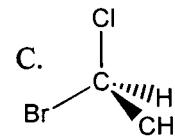
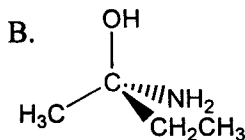
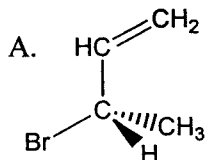
B. $C_{10}H_{16}O$

C. $C_9H_{14}O$

D. $C_8H_{12}O$

E. None of the above.

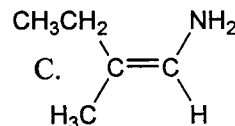
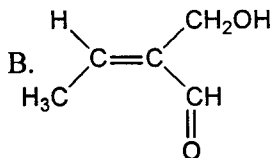
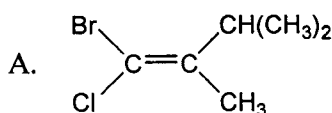
36. Which of the following is an R enantiomer?



D. Both B and C.

E. All of the above.

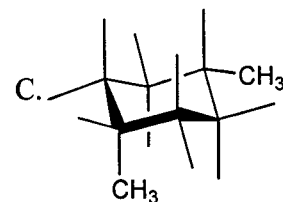
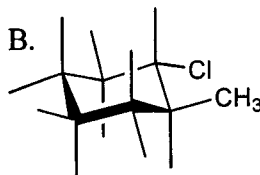
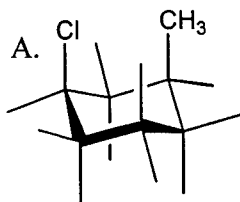
37. Which of the following is an E isomer?



D. Both A and C.

E. None of the above.

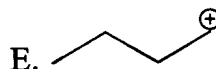
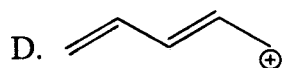
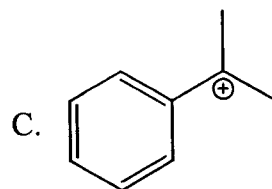
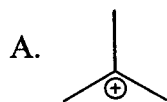
38. Which of the following is a *trans*- isomer?



D. None of the above.

E. Both B and C.

39. Which of the carbocations shown below is LEAST stable?



40. Which of the carbocations shown in the preceding question is(are) stabilized by resonance?

A. A

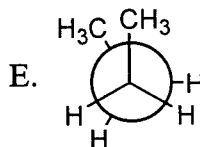
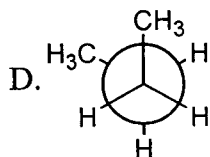
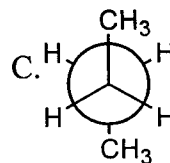
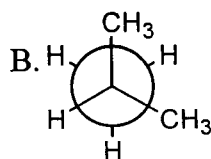
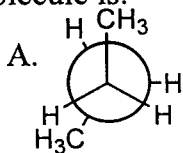
B. Both C and D

C. C

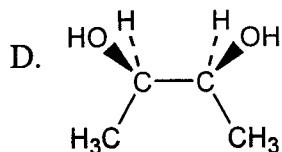
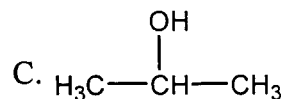
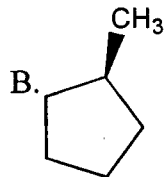
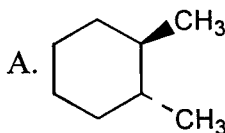
D. D

E. Both B and E

41. Newman projections for butane are shown below. The most stable conformation for this molecule is:



42. Which of the compounds shown below are chiral?



E. None of the above.

43. Which of the compounds shown in the preceding question are meso?

A. A

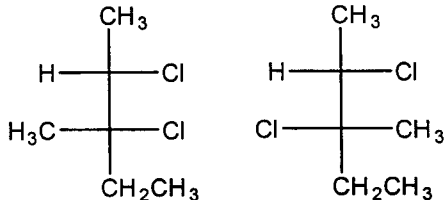
B. B

C. D

D. D

E. Both B and C.

44. How are the pair of compounds shown related?



A. identical

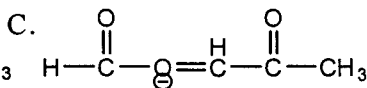
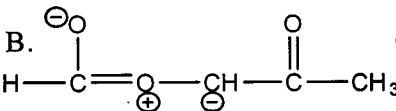
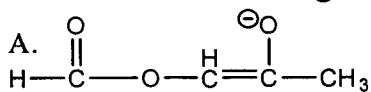
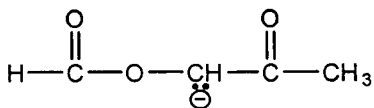
B. diastereomers

C. conformational isomers

D. enantiomers

E. structural/constitutional isomers

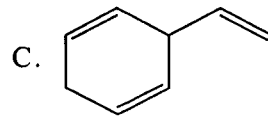
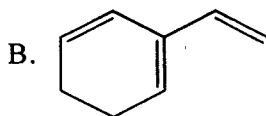
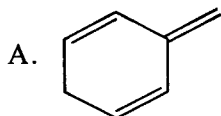
45. Which of the following is a resonance structure for the anion shown below?



D. All of the above.

E. None of the above.

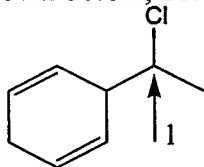
46. Which of the following has conjugated double bonds?



D. Both A and B.

E. All of the above.

47. For the compound shown below, determine the theoretical number of ^1H NMR signals.



A. seven

B. six

C. five

D. eight

E. nine

48. Consider the compound in the preceding question. The theoretical splitting pattern of the proton on the carbon labeled with a 1 is:

A. triplet

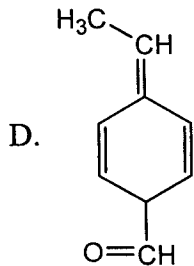
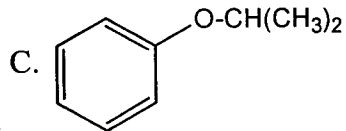
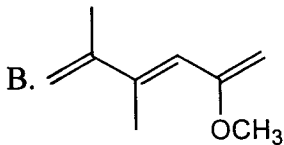
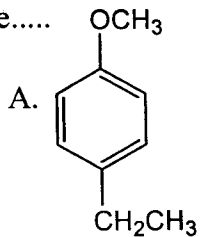
B. doublet

C. quartet

D. multiplet of eight

E. multiplet of five

55. A compound has the chemical formula $C_9H_{12}O$ and displays the following spectroscopic properties: three different 1H NMR peaks at 1.0 (doublet, 6H), 3.9 (septet, 1H), and 7.2 (singlet, 5H), and no IR absorptions at $\sim 3300\text{ cm}^{-1}$ or $\sim 1700\text{ cm}^{-1}$. This compound could be.....



E. None of the above.