

1) Which of the following will give two mono-bromination products upon free radical bromination:

A) Butane B) Cyclopentane C) Propane D) 1,1-Dimethylcyclohexane E) Heptane

A) C and D

B) A and C

C) E only

D) A only

E) A and B

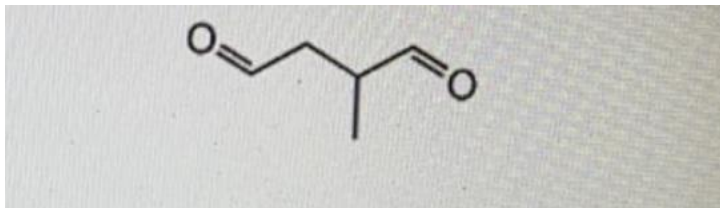
F) D only

G) B only

H) C only

Answer is: B

2) Which alkene would upon ozonolysis give the following product?



A) 3-methylcyclobutene

B) 1,2-dimethylcyclobutene

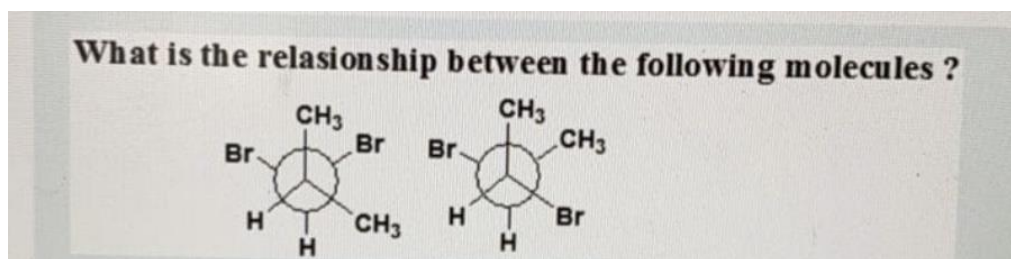
C) 1-methylcyclopentene

D) 1,3-dimethylcyclopropene

E) 4-methylcyclopentene

Answer :A

3)



- A) constitutional isomers
- B) identical
- C) configurational stereoisomers
- D) resonance structures
- E) conformations

Answer:A

4) Which compound reacts faster in electrophilic aromatic substitution?

- A) toluene
- B) 1,2-dimethylbenzene
- C) benzaldehyde
- D) 4-chlorotoluene
- E) bromobenzene

Answer:B

5) Which name is not a correct IUPAC name ?

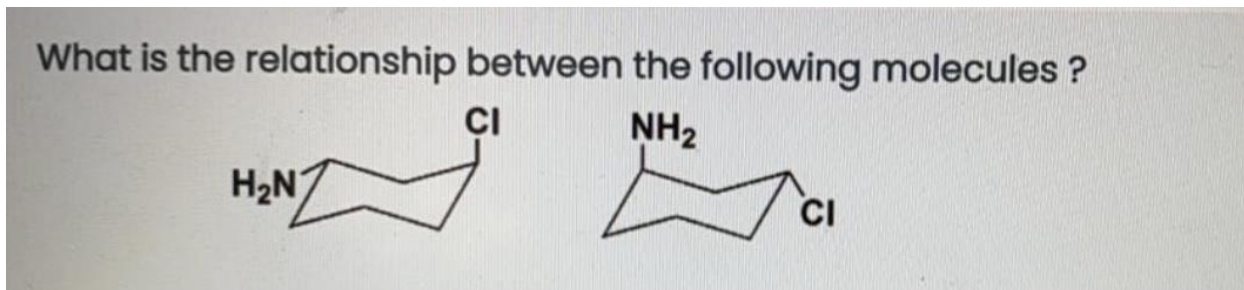
(Hint: Draw the structures first)

- A) 3-Ethyl-4-methylhexane
- B) 2-Bromo-5-chlorohexane
- C) 2,5,5-Trimethylhexane
- D) 2,5-Dimethylhexane

E) 3,3-Dimethylhexane

Answer:C

6)



A) Conformation

B) Unrelated

C) Configurational (Cis/trans) stereoisomers

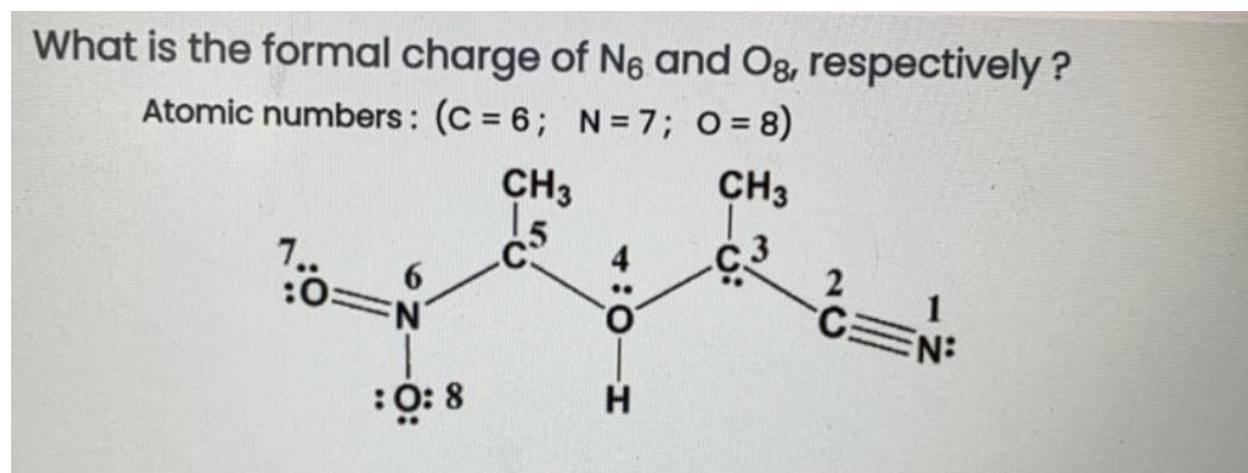
D) Identical

E) Resonance structures

F) Constitutional (structural) isomers

Answer:A

7)



A)-1,-1

B)+1,-1

C)-1,+1

D)0,0

E)+1,+1

Answer:B

8) What would be the major product(s) of electrophilic bromination of toluene?

A)3-bromotoluene

B)both 2-bromo- and 3-bromotoluene

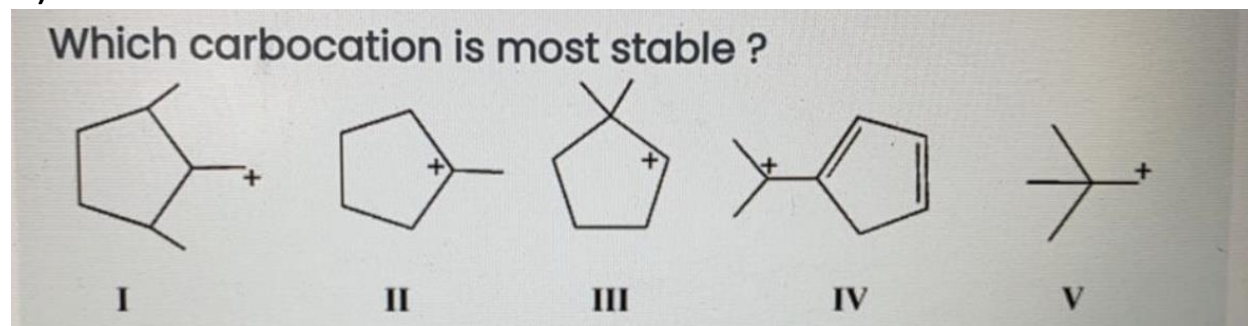
C)4-bromotoluene only

D)2-bromotoluene only

E) both 2-bromo- and 4-bromotoluene

Answer:E

9)



A)II

B)I

C)IV

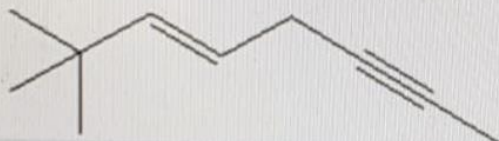
D)III

E)V

Answer:C

10)

The correct IUPAC name of the following compound

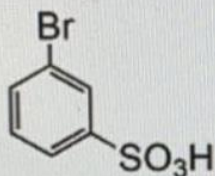


- A) trans-7,7-dimethyloct-5-en-2-yne
- B) cis-7,7-dimethyloct-5-en-2-yne
- C) cis-2,2-dimethyloct-3-en-6-yne
- D) trans-1-tert-butylhex-1-en-4-yne
- E) trans-2,2-dimethyloct-3-en-5-yne

Answer: A

11)

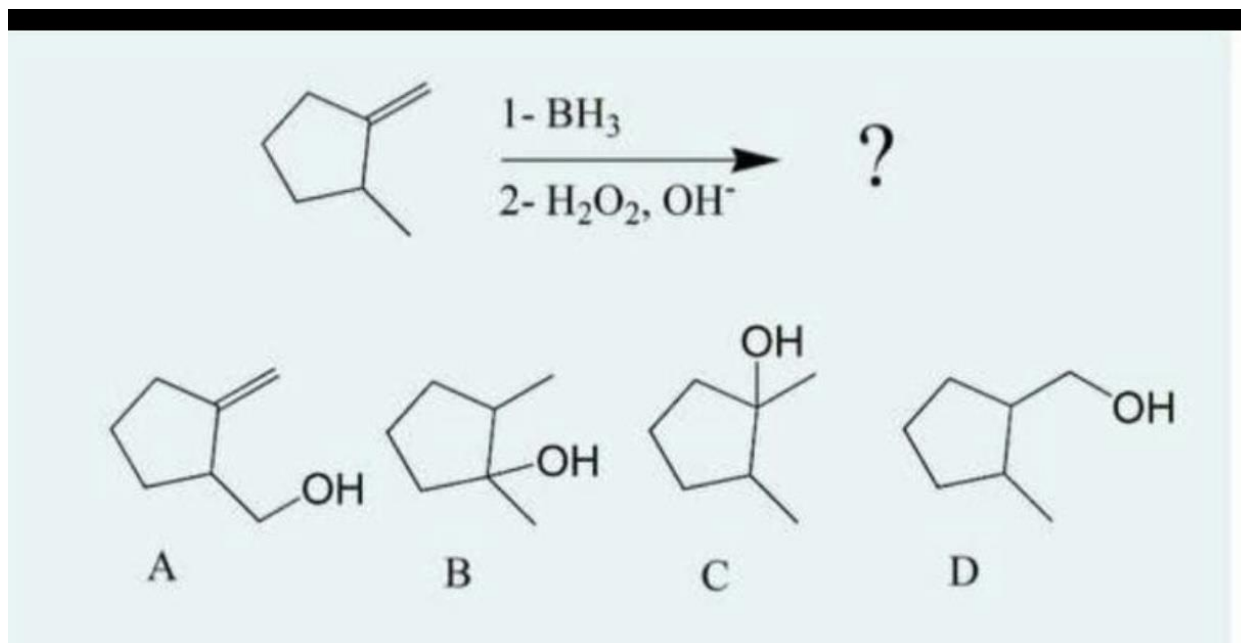
Which is the best reaction sequence to prepare this compound from benzene ?



- A)  $\text{SO}_3 / \text{H}_2\text{SO}_4$  then  $\text{Br}_2 / \text{FeBr}_3$
- B)  $\text{Br}_2 / \text{FeBr}_3$  then  $\text{H}_2\text{SO}_4 / \text{SO}_3$
- C)  $\text{H}_2\text{SO}_4 / \text{HNO}_3$  then  $\text{HBr} / \text{FeBr}_3$
- D)  $\text{SO}_3 / \text{HNO}_3$  then  $\text{Br}_2 / \text{H}_2\text{SO}_4$
- E)  $\text{Br}_2 / \text{HNO}_3$  then  $\text{H}_2\text{SO}_4 / \text{SO}_3$

Answer:A

12)



A)C

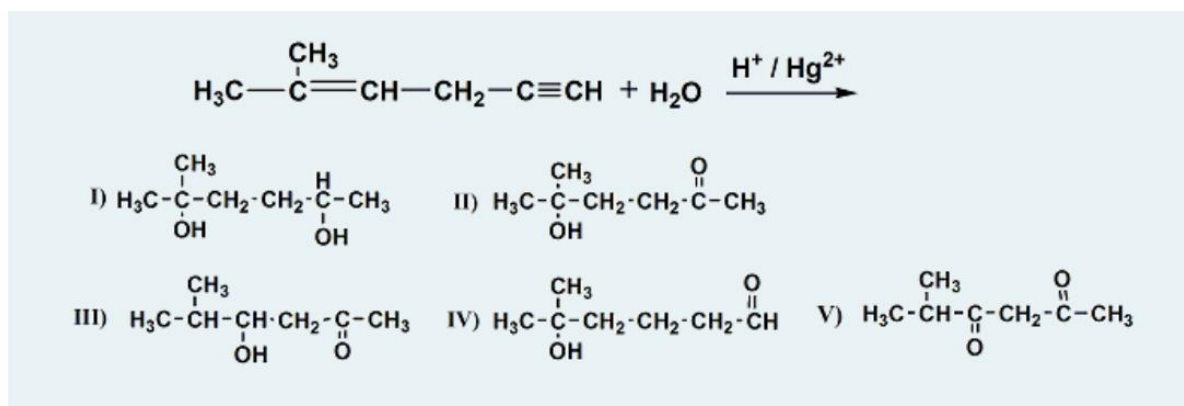
B)B

C)A

D)D

Answer:D

13)



A)IV

B)III

C)I

D)II

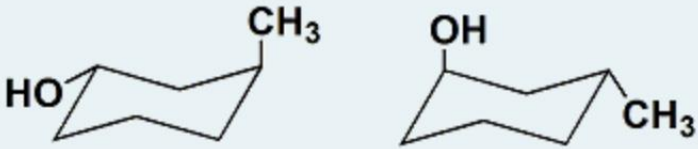
E)V

Answer:D

14)

Time left 0:37:28

What is the relationship between the following molecules ?



The image shows two chair conformations of trans-2-methylcyclohexanol. In the first structure, the hydroxyl group (HO) is axial and the methyl group (CH<sub>3</sub>) is equatorial. In the second structure, the hydroxyl group (OH) is equatorial and the methyl group (CH<sub>3</sub>) is axial. These two structures represent different conformations of the same trans isomer.

A)Unrelated

B)Identical

C)Resonance structures

D)Configurational (cis/trans) stereoisomers

E)Constitutional (structural) isomers

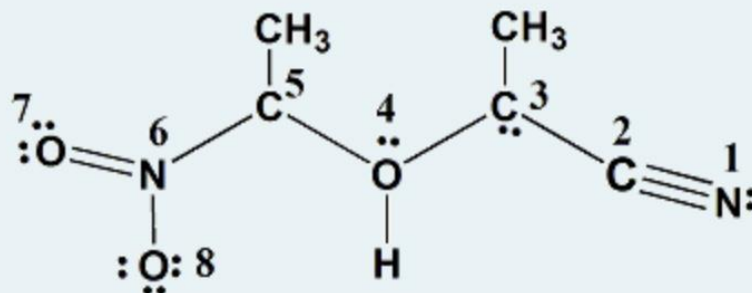
F)Conformations

Answer:F

15)

What is the formal charge of C<sub>5</sub> and O<sub>7</sub>, respectively ?

Atomic numbers : (C = 6 ; N = 7 ; O = 8)



A)+1,+1

B)0,0

C)-1,+1

D)-1,-1

E)+1,0

Answer:E

16)What is the geometry, hybridization of C-atom ,and the (H-C-H) bond angle in (CH<sub>3</sub>-CH<sub>3</sub>)?

A)trigonal planer, sp<sup>3</sup>, 109.5

B)linear, sp, 180

C)tetrahedral, sp<sup>2</sup>, 180

D)planar, sp<sup>2</sup>, 120

E)tetrahedral, sp<sup>3</sup>, 109.5

Answer:E

17) Which name is not a correct IUPAC name?

(Hint:Draw the structures first)

A)1-bromo-3-ethylbutane



B)3-bromo-1-chlorobutane

C)1,1,1-trichlorobuane

D)2,2-dimethylbutane

E)2-bromo-3-chlorobutane

Answer:A

18)Which compound reacts fastest in electrophilic aromatic substitution?

A)p-chlorobenzoic acid

B) 4-ethyl benzaldehyde

C)1,2-dichlorobenzene

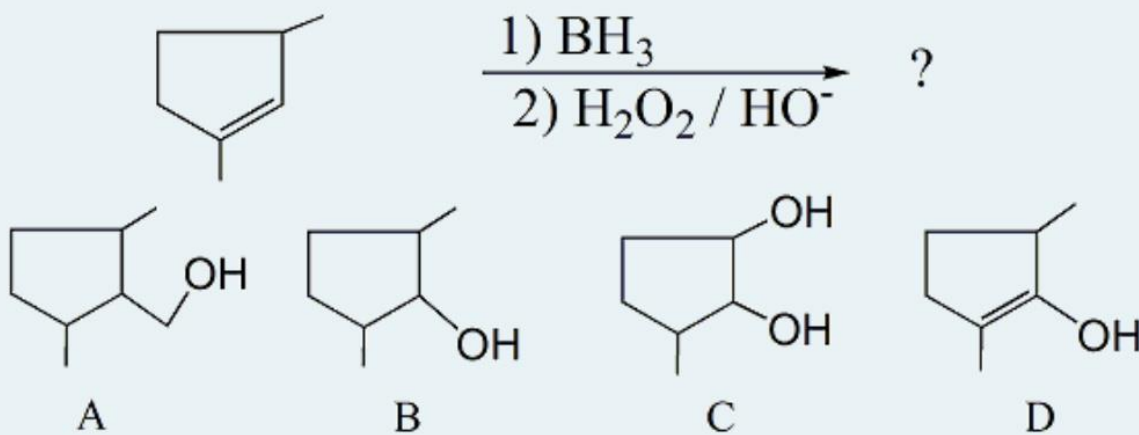
D)nitrobenzene

E)ethylbenzene

Answer:E

19)

**Select the major hydroboration product :**



A)A

B)B

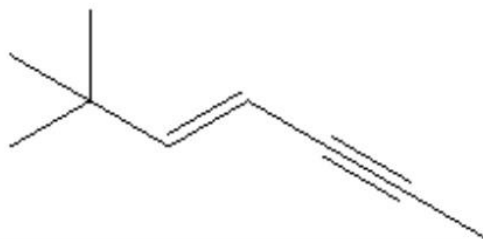
C)C

D)D

Answer:B

20)

**The correct IUPAC name of the following compound**



A)trans-6,6-dimethylhept-4-en-2-yne

B)trans-2,2-dimethylhept-3-en-5-yne

C)cis-2,2-dimethylhept-3-en-5-yne

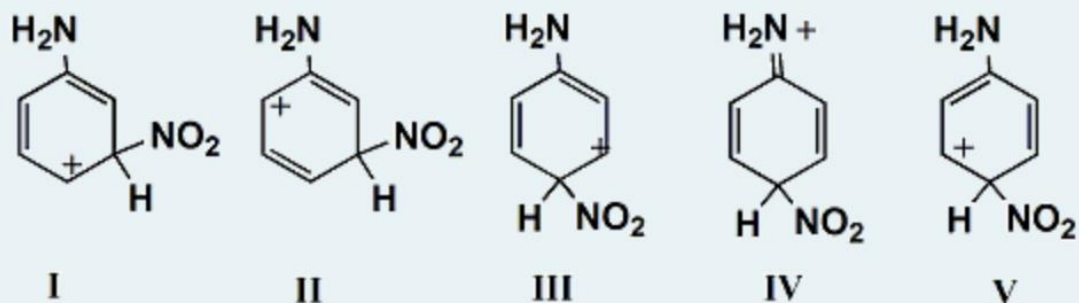
D)trans-1-tert-butylpent-1-en-3-yne

E)cis-6,6-dimethylhept-4-en-2-yne

Answer:A

21)

Which resonance structure of intermediate is most stable ?



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

Answer: A

22) Which of the following isomeric (C<sub>7</sub>) alkanes has lowest boiling point?

- A) n-heptane
- B) isoheptane
- C) 3,3-dimethylpentane
- D) 3-methylhexane
- E) 3-ethylpentane

Answer: C

23) Which compound would show cis-trans isomers?

- A) 2-methyl-2-butene
- B) 2,3-dimethyl-2-butene
- C) 2-chloro-3-methyl-1-hexene

D)1,1-dibromo-2-methylcyclohexane

E)1-bromo-2-butene

Answer:D

24)Which “trans by -product” is formed in a chain-termination step in the bromination of **ethane**?

A)n-butane

B)propane

C)cyclopropane

D)cyclobutane

E)isobutane

Answer:A

25)

Which alkene would upon ozonolysis give the

following product?



A)3-methylcyclopentene

B)1-methylcyclobutene

C)1-methylcyclopenten

D)3-methylcyclohexene

E)1,3-dimethylcyclobutene

Answer:A

26)Which compound has the most acidic C-H bond?

- A)1-pentyne
  - B)2-pentyne
  - C)benzene
  - D)1-enten
  - E)2-penten
- Answer:B

27)What would be the major product(s) of bromination of\* nitrobenzene?

- A)m-bromonitrobenzene only
- B)o-bromonitrobenzene only
- C)p-bromonitrobenzene only
- D)both 2-bromo-and 4-bromonitrobenzene
- E)both 2-bromo-and 3-bromonitrobenzene

Answer:

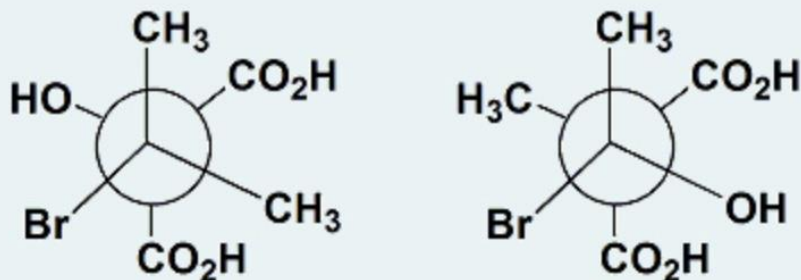
28) The most stable conformation of trans-1-methyl-3-propylcyclohexane will have?

- A)propyl equatorial , methyl axial
- B) both groups at the same side of ring
- C)both groups axial
- D) both grups equatorial
- E)methyl equatorial ,propyl axial

Answer:A

29)

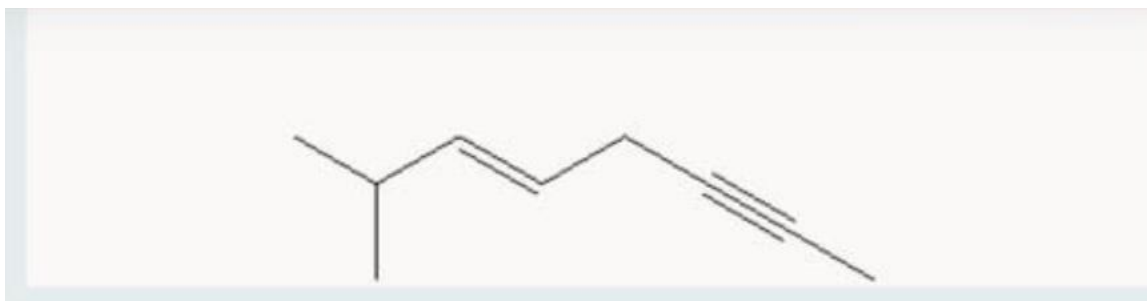
What is the relationship between the following molecules ?



- A) conformations
- B) configurational stereoisomers
- C) identical
- D) resonance structures
- E) constitutional isomers

Answer: D

30) The correct IUPAC name for the following compound is?



- A) trans-2-methyloct-3-en-6-yne
- B) cis-7-methyloct-5-en-2-yne
- C) trans-7-methyloct-5-en-2-yne

D)trans-1-isoprpylhex-1-en-4-yne

E)cis-2-methyloct-3-en-6-yne

Answer:C

31)Which name is not a correct IUPAC name?

A)3-ethyl-3-methylhexane

B)3-bromo-3-methylhexane

C)2-ethyl-3-methylhexane

D)2-bromo-5-methylhexane

E)1-bromo-6-chlorohexane

Answer: C

32)Which compound has the most acidic C-H bond?

A)benzene

B)1-octene

C)2-octyne

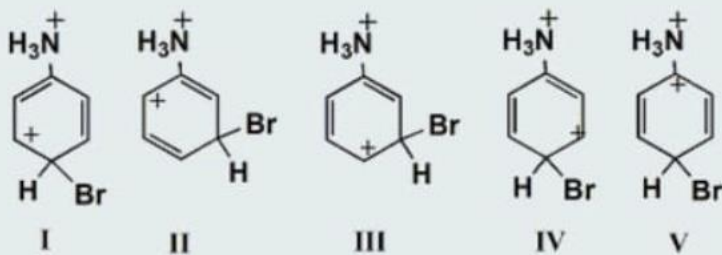
D)2-octene

E)1-octyne

Answer:E

33)

Which resonance structure of intermediate is least stable ?



A)V

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

Answer:A

34)Which is the best reaction sequence to prepare 4-nitrotoluene from benzene?

- A)CH<sub>3</sub>Br/AlCl<sub>3</sub> then HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>
- B)HNO<sub>3</sub>/SO<sub>3</sub> then Br<sub>2</sub>/FeBr<sub>3</sub>
- C)HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> then. CH<sub>2</sub>=CH<sub>2</sub>/H<sup>+</sup>
- D)HNO<sub>3</sub>AlCl<sub>3</sub> then CH<sub>3</sub>Br/H<sub>2</sub>SO<sub>4</sub>
- E)HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> then CH<sub>3</sub>Br/AlCl<sub>3</sub>

Answer:A

35)

What is the relationship between the following molecules ?

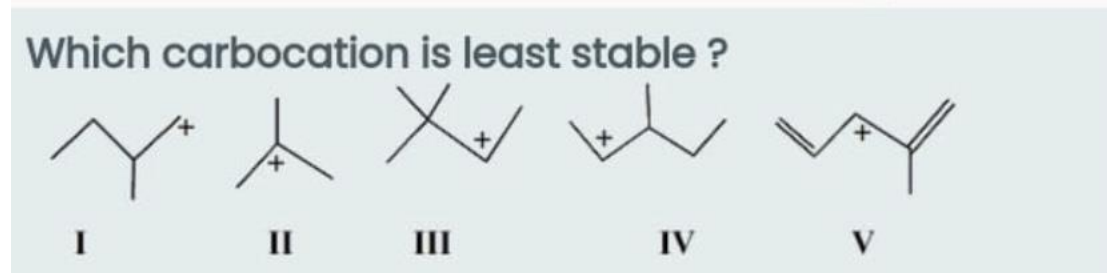


- A)Conformational stereoisomers
- B)identical
- C)Configurational (cis/trans)stereoisomers
- D)Not related
- E)resonance structures
- F)Constitutional (structural) isomers



Answer:F

36)



A)III

B)I

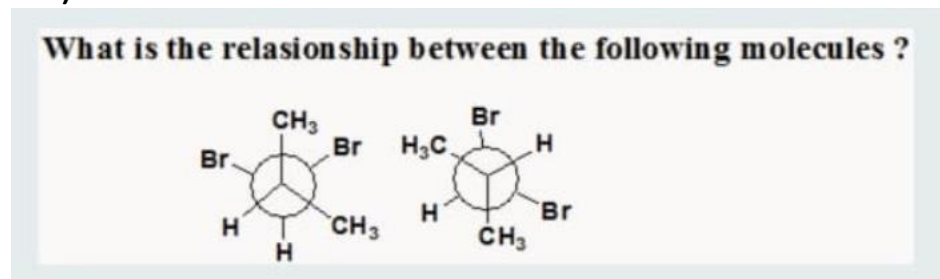
C)V

D)II

E)IV

Answer: B

37)



A)conformation

B)constitutional isomers

C)resonance structures

D)configurational stereoisomers

E)identical

Answer:A

38) Which compound would show cis-trans isomers ?

- A)2,3-dimethyl-2-butene
- B)2-methyl-1-butene
- C)1,1-dibromo-2-methylcyclobutane
- D)1-bromo-2-methylcyclobutane
- E)methylpropene

Answer:D

39)The most stable conformation of 1-butyl-1-ethylcyclohexane will have :

- A) both groups equatorial
- B)both groups axial
- C)butyl equatorial, ethyl axial
- D)butyl axial,ethyl equatorial
- E)both groups on same side of ring

Answer:C

40)Which of the following isomeric (C<sub>6</sub>) alkanes has lowest boiling point?

- A)n-hexane
- B)2,2-dimethylbutane
- C)3-methylpentane
- D)isohexane
- E)2-methylpentane

Answer:B

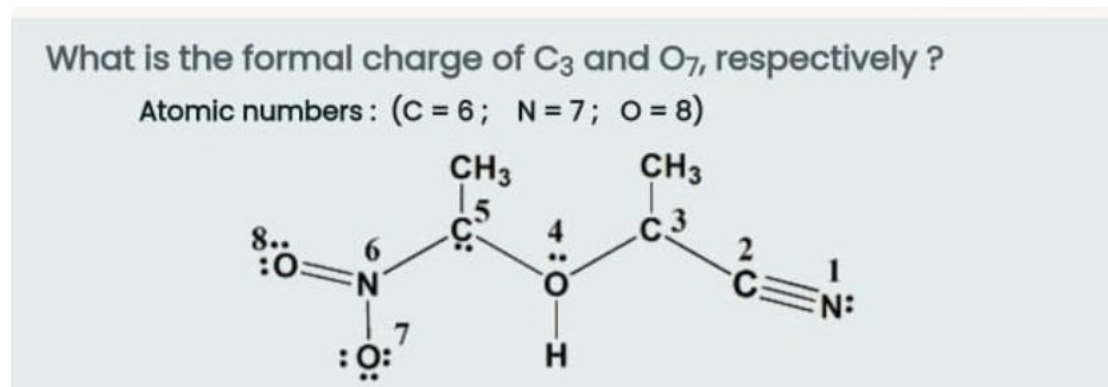
41)which "trace by-product" is formed in a chain-terminating step in the bromination of n-butane?

- A)n-octane
- B)isooctane

- C)isobutane
- D)cyclooctane
- E)cyclobutane

Answer:A

42)



- A)+1,+1
- B)-1,-1
- C)+1,-1
- D)0,-1
- E)+1,0

Answer:C

43)which of the following will give three mono-bromination product upon free radical bromination:

- A)Butane
- B)pentane
- C)hexane
- D)1,1-dimethylcyclohexane
- E)Heptane

- A)B only
- B)C and E
- C) D only

D)B and C

E)D and E

F) E only

G)C only

Answer: D

44)what is the geometry,hybridization of C and the bond angle in the methyl carbocation ( $\text{CH}_3^+$ )?

A)planar, $\text{sp}^2$ ,120

B)tetrahedral, $\text{sp}^3$ ,109.5

C)tetrahedral, $\text{sp}^3$ ,120

D)planar, $\text{sp}$ ,180

E)linear, $\text{sp}$ ,180

Answer:A

Done by Mais Fareed , Afia Mohammed and Jasmine  
Othman 