CHEMISTRY COACHING CIRCLE

+1

GRAND TEST - 8

TEST - 34

LEVEL - 1 & LEVEL - 2

TOPIC:
ORGANIC CHEMISTRY

- IUPAC Naming
- Nomenclature
- Isomerism
- General Organic Chemistry
- Hydrocarbon
- Analysis of Organic Compound

Test Date: 11.2.2018 (Sunday)
Time: 11:00 AM to 01:30 PM

Empowered By:

TEST SERIES

PCB QUANTUM Plus | **PCM** INTELLIQUEST

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IMPORTANT INSTRUCTIONS

- **Test Duration: 11:00 AM to 1:30 PM**
- **This test consist of 2 Levels.**

Level – I

Time: 75 Minutes

50 Qs. × 4 = 200 Marks

(Single Answer Type) [Negative Marking = – 1]

Level – II

Time: 75 Minutes

40 Qs = 180 Marks

- **Single Answer Type [Negative Marking (-1)] = 8 × 4 = 32 Marks**
- **Assertion & Reason [Negative Marking (-1)] = 10 × 4 = 40 Marks**
- **Comprehension Type [Negative Marking (-1)] = 8 × 4 = 32 Marks**
- **More than One Answer [No Negative Marking] = 6 × 5 = 30 Marks**
- **Matrix Match Type [No Negative Marking] = 2 × 8 = 16 Marks**
- **Integer Type [No Negative Marking] = 6 × 5 = 30 Marks**

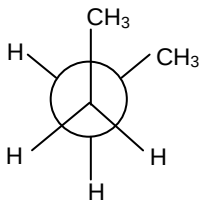
- **Every candidate will get 2 OMR Sheets for answering Level – I and Level – II separately. The candidate will start with Level – I first and return Level I OMR sheet immediately at 12:15 pm after 75 minutes. So please ensure to fill up OMR on time.**
- **OMR sheet for Level – II will be collected immediately after complete of test time at 1:30 pm.**
- **Usage of Mobile is strictly prohibited in the examination hall. The mobile must be kept switched off during exam time. Anybody seen using or fiddling with mobile phone will get disqualified for the test.**
- **Unfair means of any sort during exam will entail cancellation and disqualification of his/her paper.**
- **Paper will be discussed on 12/2/2018 as per batch timings.**
- **Answer Key will be given only after completion of paper. Detailed answer will be uploaded on website.**

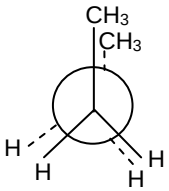
Level – 1

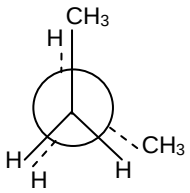
Single Answer Type (Negative Marking [-1])

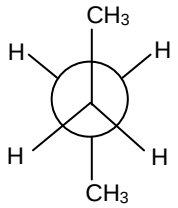
This Section contains **50 multiple choice questions.** Each question has four choices A), B), C) and D) out of which **ONLY ONE** is correct. (Mark only One choice) **50 × 4 = 200 Marks**

1. Which of the following conformers of n-butane has torsional strain and steric strain

a. 

b. 

c. 

d. 

B

2. 2-Methyl propene is isomeric with But-1-ene. They can be distinguished by:

a. Baeyer's reagent b. Ammonical $AgNO_3$ c. Br_2 solution d. O_3, Zn/H_2O

D

Sol. Both give different product on ozonolysis

3. 2-Butyne and 1, 3-Butadiene are:

a. chain isomer b. position isomer c. functional isomer d. tautomers

C

4. $(A)\,C_4H_6 \xrightarrow[\text{lindlard catalyst}]{} (B)\ C_4H_8 \xrightarrow{O_3/H_2O} 2CH_3COOH$:

Hence A and B are:

a. $CH_3C \equiv CCH_3,\ CH_3CH = CHCH_3$ b. $CH_2 = CHCH = CH_2,\ CH_3CH = CHCH_3$

c.  , $CH_3CH = CHCH_3$ d. None

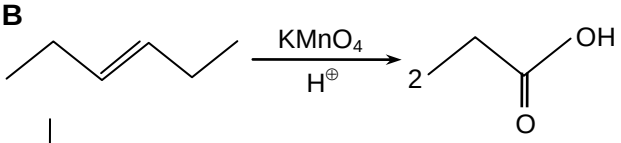
A

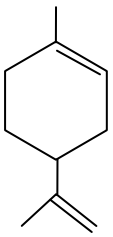
Sol. $CH_3 - C \equiv C - CH_3 \longrightarrow CH_3 - CH = CH - CH_3 \xrightarrow[\text{Ozonolysis}]{\text{Oxidative}} 2CH_3COOH$

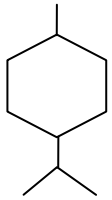
5. A hydrocarbon X adds on one mole of hydrogen to gives another hydrocarbon and also decolourises bromine water. X reacts with $KMnO_4$ in presence of acid to give two moles of the same carboxylic acid. The structure of X is:

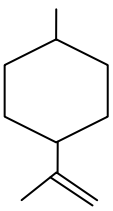
a. $CH_3CH = CH{\cdot}CH_2CH_2CH_3$ b. $CH_3CH_2CH = CHCH_2CH_3$
c. $CH_3CH_2CH_2 - CH = CHCH_3$ d. $CH_2 = CH - CH_2CH_2CH_3$

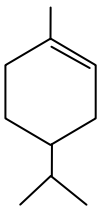
B

Sol. 

6.  $\xrightarrow[(1\ \text{Mole})]{H_2,\ Ni}$ Product:

a. 

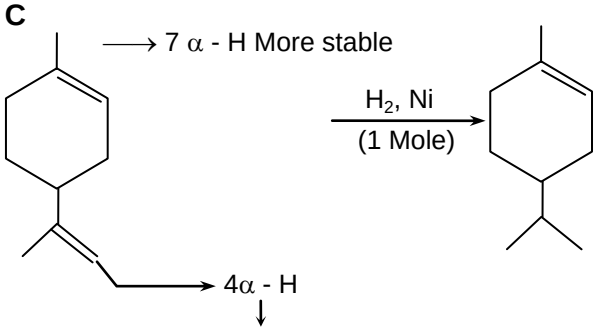
b. 

c. 

d. No reaction

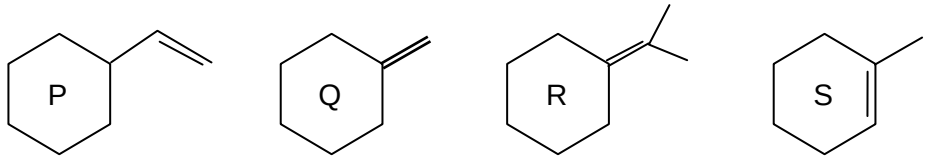
C

Sol.



(less stable so reacts faster than the double bond in the ring)

7. Arrange the following alkenes in increasing order of their enthalpy of hydrogenation (—ΔH) :

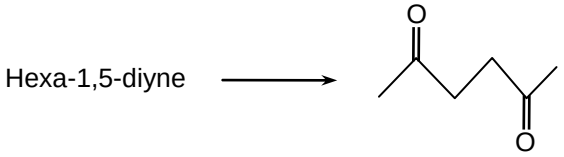


a. R < S < Q < P b. R < S < P < Q c. P < Q < R < S d. P < Q < S < R

A

Sol. As the no. of α - H increases stability increases and heat of hydrogenation decreases
R = 10 H.C; S = 7 H.C; Q = 4 H.C; P = 1 H.C

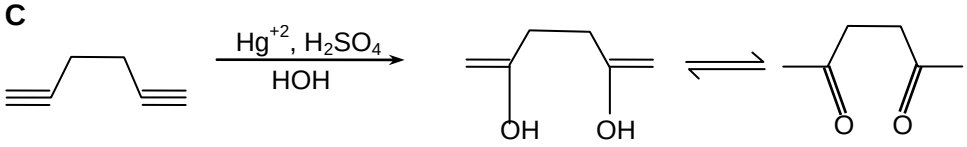
8. How is the following transformation best carried out?



a. OsO_4; $NaHSO_3$ b. H_2SO_4/H_2O c. $HgSO_4/H_2SO_4,H_2O$ d. HIO_4

C

Sol.



(enol)

9. Which of the following is the free radical chain reaction?

a. $2CH_3I + 2Na \longrightarrow CH_3 - CH_3 + 2NaI$

b. $CH_4 + Cl_2 \xrightarrow{h\nu} CH_3Cl + HCl$

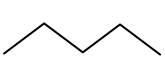
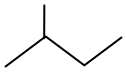
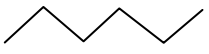
c. $2CH_3CO\overset{\ominus}{O}\overset{\oplus}{Na} \xrightarrow{\Delta} CH_3 - CH_3 + 2CO_2 + 2NaOH + H_2$

d. $CH_3 - CH = CH_2 + HBr \longrightarrow CH_3 - \underset{Br}{\underset{|}{C}}H - CH_3$

B

Sol. (a) = Wurtz Reaction (b) free Radical chain Reaction (c) decarboxylation (d) electrophilic addition

10. Among the following, the compound which has highest boiling point is:

a.  b.  c.  d. 

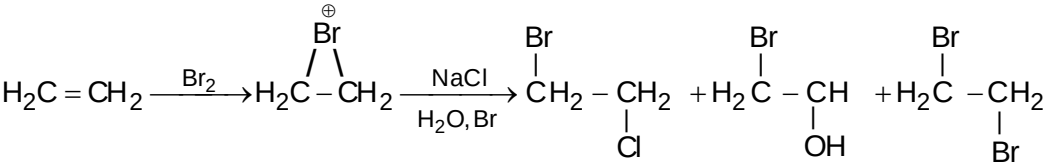
C

Sol. Compound contain 6 carbon.

11. The reaction of ethene with Br_2 in the presence of aqueous NaCl gives:

a. 1,2-dibromoethane b. 2-bromoethanol
c. 1-bromo-2-chloroethane d. all of these

D

Sol. 

12. Propane can be best prepared by the reaction:

a. $CH_3CH_2I + CH_3I + Na \xrightarrow{Et_2O}$

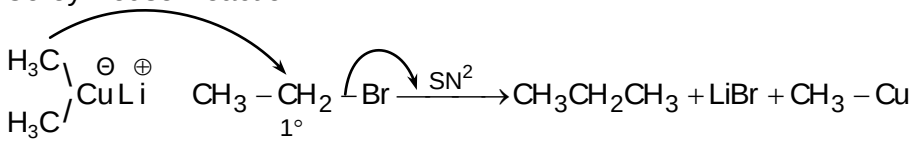
b. $CH_3CH_2COONa + CH_3COONa \xrightarrow[\text{Electrolysis}]{H_2O}$

c. $CH_3CH_2Br + CH_3Li \xrightarrow[CuBr]{Et_2O}$

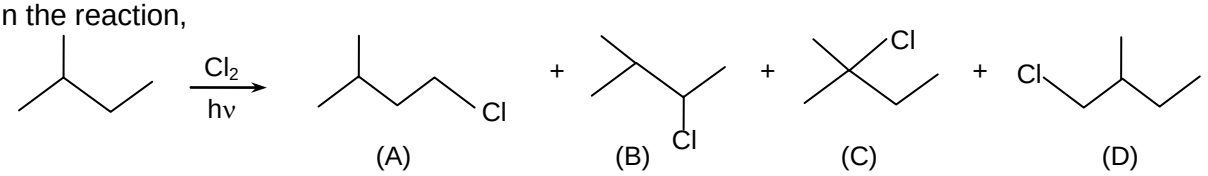
d. $CH_3CH_2CH(CH_3)COONa \xrightarrow[CaO,\Delta]{NaOH}$

C

Corey House Reaction

Sol. 

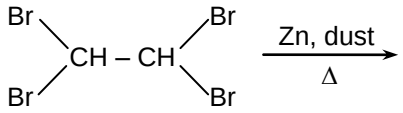
13. The relative reactivity of 1°, 2° and 3° hydrogens in chlorination reaction has been found to be 1 : 3.8 : 5. In the reaction,

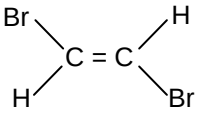


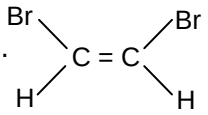
The ratio of the amount of the product (A), (B), (C) and (D) is expected to be:

a. 1 : 3.8 : 5 : 1 b. 3 : 7.6 : 5 : 6 c. 3 : 7.6 : 5 : 3 d. 1 : 7.6 : 5 : 1

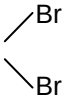
B

14. 

a. 

b. 

c. $H - C \equiv C - H$

d. 

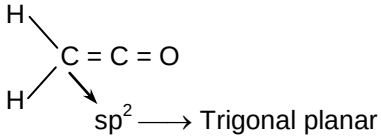
C

Sol. Zn, Δ is used for the elimination of vicinaldihalide.

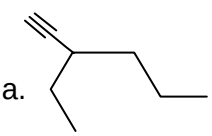
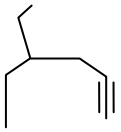
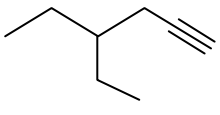
15. Which of the following molecules is not linear?

a. $O = C = C = C = O$ b. $H_2C = C = O$ c. $HC \equiv C - C \equiv CH$ d. $HC \equiv CH$

B

Sol. 

16. Which alkyne gives 3-ethylhexane on catalytic hydrogenation?

a.  b.  c.  d. All of these

D

17. Which of the following electrophilic substitution reaction is Reversible

a. Chlorination
b. sulphonation
c. nitration
d. Friedal craft Reaction

B

18. The reaction of one equivalent of HBr with $CH_2 = CH - C \equiv CH$ gives

a. $CH_2 = CH - C \equiv CBr$
b. $CH_2 = CH - CBr = CH_2$
c. $CH_3 - CHBr - C \equiv CH$
d. $CH_2 = CH - CH = CHBr$

B

Sol. Conjugation is the driving force

19. A hydrocarbon (A) on chlorination gives (B), which on reacting with alcoholic KOH changes into another hydrocarbon (C). The latter decolorizes Baeyer's reagent and on ozonolysis forms formaldehyde only (A) is:

a. Methane
b. Ethene
c. Ethane
d. Butane

C

Sol. $H_3C - CH_3 \xrightarrow[h\nu]{Cl_2}$ (B) $\xrightarrow{\text{alc. KOH}} H_2C = CH_2$

(A) (B) (C)

20. In a mixture of isooctane and n – heptane, the percentage of n – heptane is 15, the octane number of the fuel is:

a. 15
b. 85
c. 95
d. 100

B

Sol. It octane number is 85 because percentage of isooctane is 85%.

21. The compound which produces propane on heating with HI in presence of phosphorus is:

a. $CH_3CH_2CH_2I$
b. CH_3CH_2CHO
c. $CH_3CH_2CH_2OH$
d. All of these

D

Sol. $CH_3CH_2CH_2I + HI \xrightarrow{\text{red P}} CH_3CH_2CH_3 + I_2$

$CH_3CH_2CH_2OH + 2HI \xrightarrow{\text{red P}} CH_3CH_2CH_3 + 2I_2 + 2H_2O$

$CH_3CH_2CHO + 4HI \xrightarrow[423\,K]{\text{red P}} CH_3CH_2CH_3 + 2I_2 + 2H_2O$

22. Which of the following on treatment with hot alkaline $KMnO_4$ gives benzoic acid?

a. Toluene
b. Ethylbenzene
c. Isopropyl benzene
d. All of these

D

Sol. Benzylic carbon is oxidised to – COOH

23. The ortho/para directing group among the following is:

a. – COOH
b. – CN
c. $-COCH_3$
d. $-NHCOCH_3$

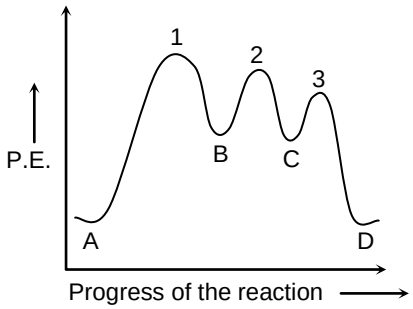
D

24. Photochemical fluorination is explosive while iodination is too slow to occur. The reason for this is:

a. bond dissociation energy of I_2 is minimum
b. formation of $CH_3 - F$ is most endothermic
c. formation of H – F is most exothermic while formation of HI is endothermic
d. F_2 has lower bond dissociation energy than Cl_2 and Br_2

C

25. Energy profile diagram for an exothermic reaction, $A \xrightarrow{1} B \xrightarrow{2} C \xrightarrow{3} D$, is given below.



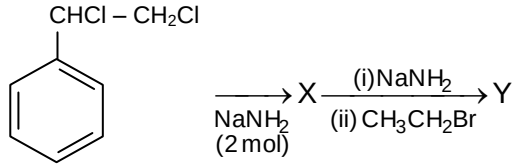
The rate determining step of the reaction is:

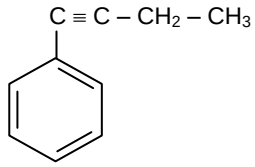
a. $A \longrightarrow B$ b. $B \longrightarrow C$ c. $C \longrightarrow D$ d. cannot predict

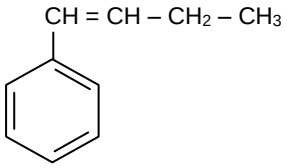
A

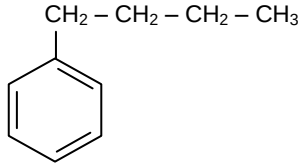
Sol. Step which has highest energy T.S. is known as R.D.S.

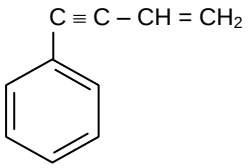
26. The compound Y in the following sequence of reaction is



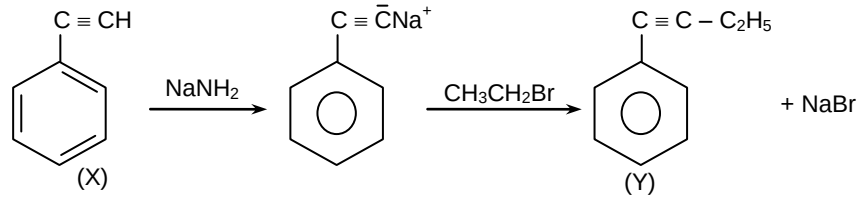
a. 

b. 

c. 

d. 

A

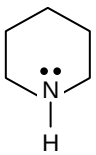
Sol. 

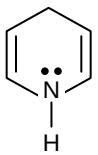
27. Which of the following is correct order of stability of conformation of cyclohexane

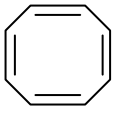
a. Chair form > Boat form > Twist boat > Half chair
b. Chair form > Twist Boat > Boat > Half chair
c. Chair form > Half chair > Twist Boat > Boat
d. Boat > Half chair > Twist Boat > Chair

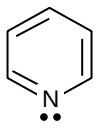
B

28. Which of the following is aromatic?

a. 

b. 

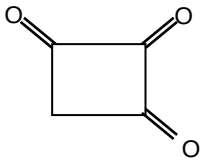
c. 

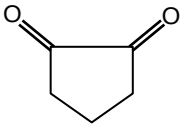
d. 

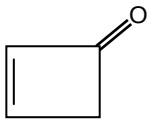
D

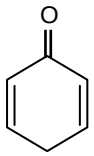
Sol. It is pyridine, $6\pi e^-$ system

29. Which of the following has unstable enol form?

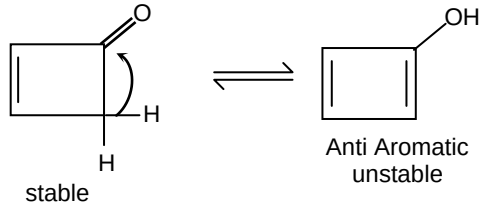
a. 

b. 

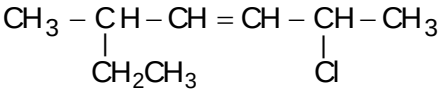
c. 

d. 

C

Sol. 

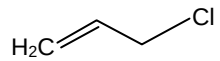
30. What is the correct IUPAC name of following compound:

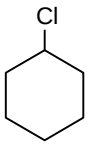


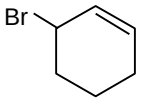
a. 5-Methyl-2-Chlorohept-3-ene
b. 2-Chloro-5-ethylhept-3-ene
c. 2-Chloro-5-methylhept-3-ene
d. 2-Ethyl-5-Chlorohex-3-ene

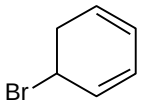
C

31. Which of the following will be dehydrohalogenated most rapidly ?

a. 

b. 

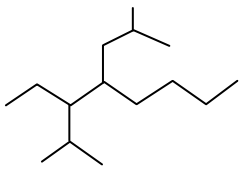
c. 

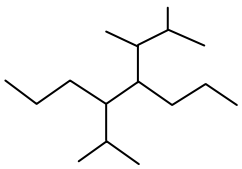
d. 

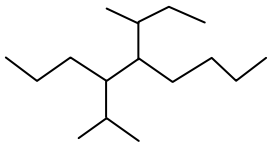
D

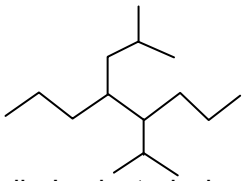
Sol. Due to formation of most stable product benzene.

32. The correct structure of 2-Methyl-5-(methylethyl)-4-propyloctane is:

a. 

b. 

c. 

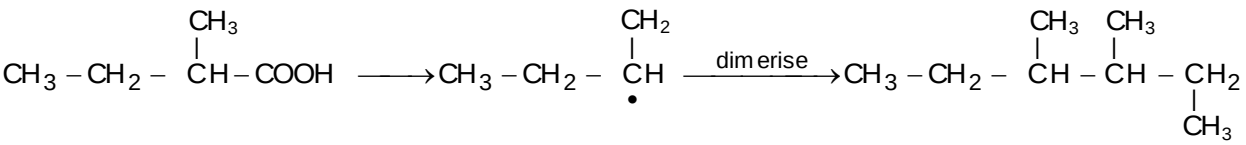
d. 

D

33. Which of the following hydrocarbon will be formed on Kolbe's electrolysis of 2-methylbutanoic acid.

a. 2,5-Dimethylhexane
b. Hexane
c. 2,3-Dimethyl butane
d. 3,4-Dimethyl hexane

D

Sol. 

34. Acetylenic hydrocarbons are acidic because:

a. acetylene belongs to the class of alkynes with general formula C_nH_{2n-2}.
b. acetylene has only one hydrogen atom at each carbon atom.
c. acetylene contains least number of hydrogen atoms among the hydrocarbons.
d. sigma electron density of C-H bond in acetylene is nearer a carbon which has 50% s-character.

D

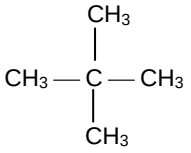
35. Which of the following reagent is used to convert 2-methyl butanoic acid to butane.

a. $Ni + H_2$ b. Sodalime, Δ c. Red P + HI d. Kolbe's electrolysis

B

Sol. $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-(COO)H \longrightarrow CH_3-CH_2CH_2-CH_3$

36. Arrange the following alkanes in decreasing order of their heat of combustion:



(X)

(Y)

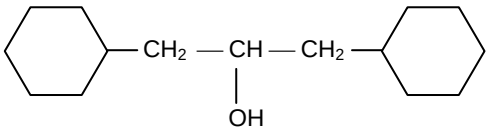
(Z)

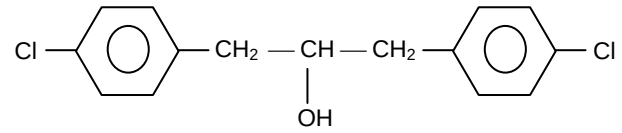
a. X > Y > Z b. Z > X > Y c. Z > Y > X d. X > Z > Y

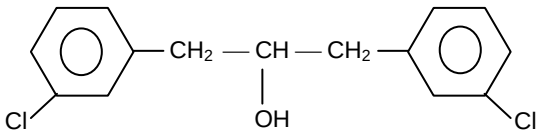
C

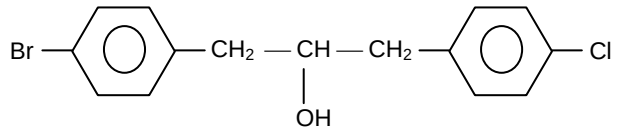
Sol. Branching decreases Rate of Combustion

37. Which of the following compound possesses chiral carbon?

a. 

b. 

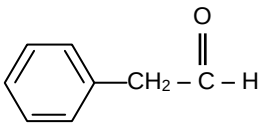
c. 

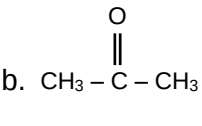
d. 

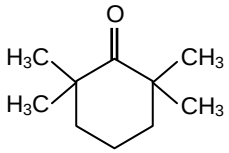
D

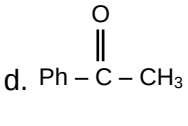
Sol. A tetrahedral carbon to which four different groups are attached is chiral carbon.

38. Which of the following compounds will not exhibit enolization?

a. 

b. 

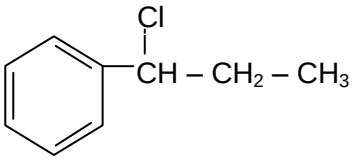
c. 

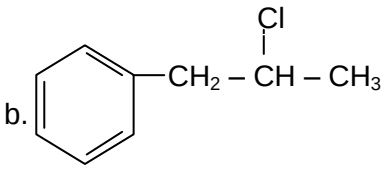
d. 

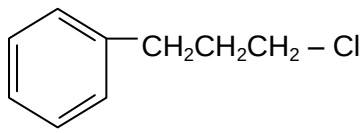
C

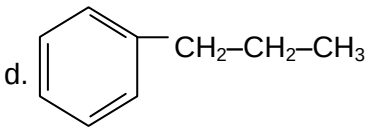
Sol. No α - H in C.

39. Propyl benzene with Cl_2 in presence of light gives:

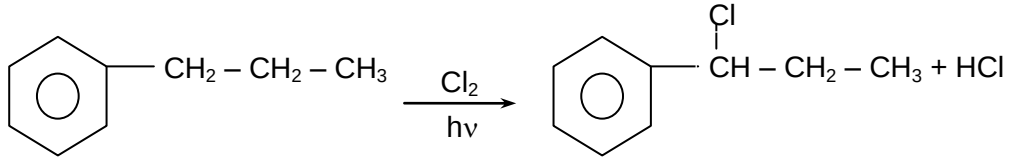
a. 

b. 

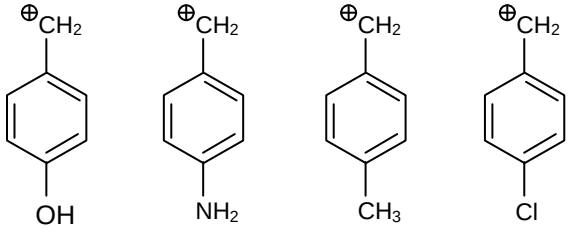
c. 

d. 

A

Sol. 

40. Which of the following is correct order of stability

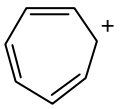


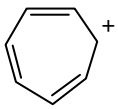
(P) **(Q)** **(R)** **(S)**

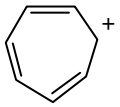
a. P > Q > R > S b. Q > S > R > P c. Q > P > S > R d. Q > P > R > S

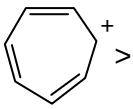
D

41. The correct order of stability of the following carbocations is

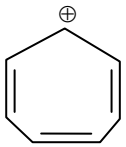
a. $(CH_3)_2CH^+ > (CH_3)_3C^+ > Ph_3C^+ >$ 

b.  $> Ph_3C^+ > (CH_3)_3C^+ > (CH_3)_2CH^+$

c. $Ph_3C^+ >$  $> (CH_3)_2CH^+ > (CH_3)_3C^+$

d. $(CH_3)_3C^+ > (CH_3)_2\overset{+}{C}H >$  $> Ph_3C^+$

B

Sol.  =Tropylium ion is aromatic due to positive charge, therefore most stable

42. Which of the following is correct match.

	Common Name	**IUPAC name**
a.	Isopentane	3-Methylpentane
b.	Toluene	1,2-Dimethyl benzene
c.	Isobutyl chloride	1-Chloro-2-methylpropane
d.	Neopentane	2-Methylbutane

C

Sol. Neopentane = $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-CH_3$; 2,2 - Dimethylpr opane

Isopentane = $CH_3-\underset{}{\overset{\displaystyle CH_3}{\overset{|}{CH}}}-CH_2-CH_3$ $= 2-$ Methylbu tan e

Toluene = methyl benzene

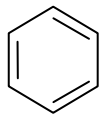
Isobutylchloride = $CH_3-\underset{}{\overset{\displaystyle CH_3}{\overset{|}{CH}}}-CH_2-Cl$ $= 1-$ Chloro $-2-$ Methylprop ane

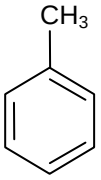
43. Which of the following compound will not show Lassaigne's solution test

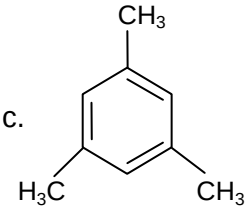
a. CH_3NH_2 b. $CH_3 - CH_2 - Cl$ c. $NH_2 - OH$ d. CH_3CONH_2

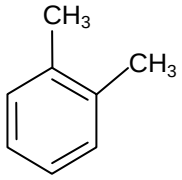
C

44. $3CH_3 - C \equiv CH \xrightarrow[Cu\ tube]{Red\ hot}$

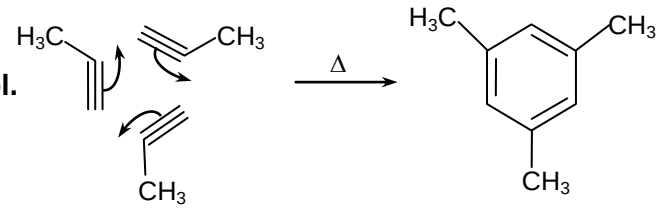
a. 

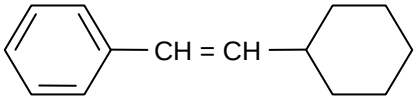
b. 

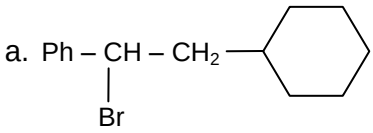
c. 

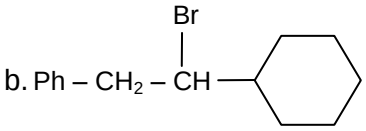
d. 

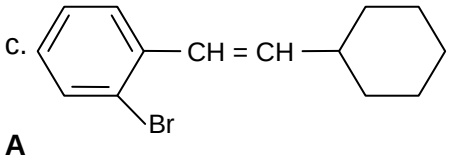
C

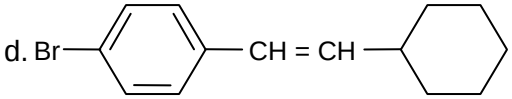
Sol. 

45.  $\xrightarrow{HBr}$ Major product :

a. 

b. 

c. 

d. 

A

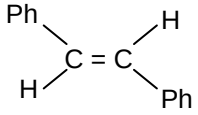
46. Two gases P and Q both decolourise aqueous bromine but only one of them gives white ppt with Tollen's reagent. P and Q are likely to be:

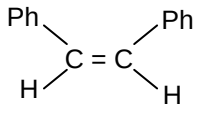
a. $H_2C = CH_2$ and $CH_3 - C \equiv C - CH_3$
b. $HC \equiv CH$ and $CH_3 - CH_2 - C \equiv CH$
c. $HC \equiv CH$ and $CH_3 - C \equiv CH$
d. $CH_3 - CH_2 - C \equiv CH$ and $CH_3 - C \equiv C - CH_3$

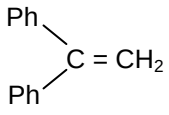
D

47. $Ph - CH = CH - Ph \xrightarrow[CCl_4]{Cl_2} X \xrightarrow{2NaNH_2} Y \xrightarrow{H_2, Pd\text{-}CaCO_3} Z$

Identify product (Z) of the reaction.

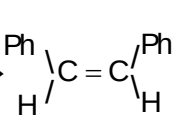
a. 

b. 

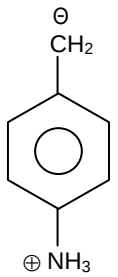
c. 

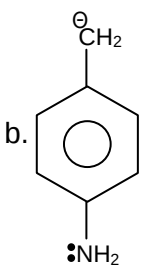
d. $Ph - C \equiv C - Ph$

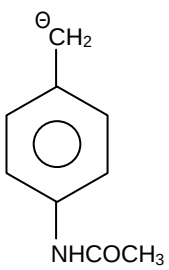
B

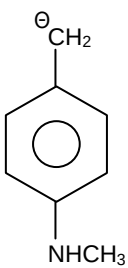
Sol. $Ph - CH = CH - Ph \xrightarrow[CCl_4]{Cl_2} Ph - \underset{Cl}{CH} - \underset{Cl}{CH} - Ph \xrightarrow{2NaNH_2} Ph - C \equiv C - Ph \xrightarrow[CaCO_3]{H_2, Pd}$ 

48. The most stable carbanion is

a. 

b. 

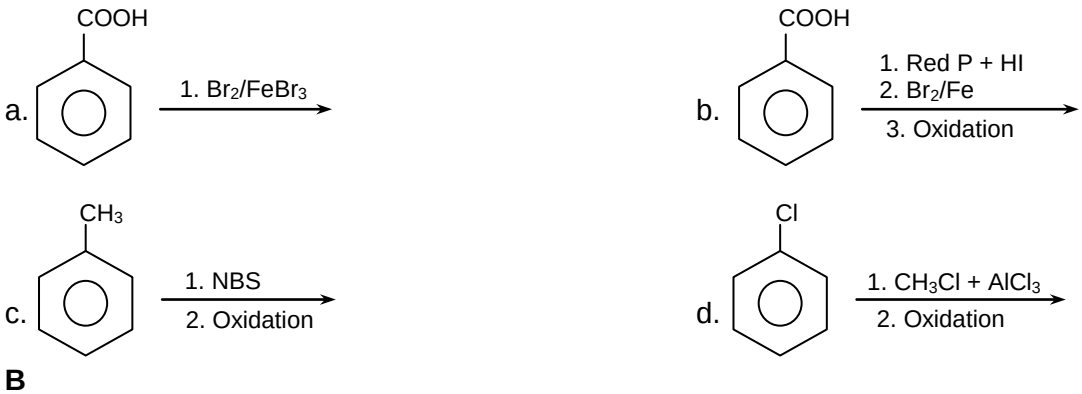
c. 

d. 

A

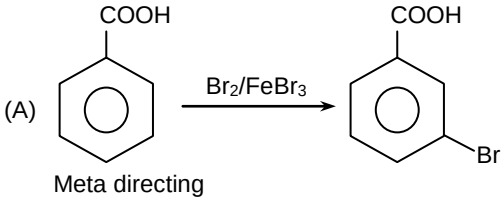
Sol. Due to –I effect of $-\overset{\oplus}{N}H_3$ gp

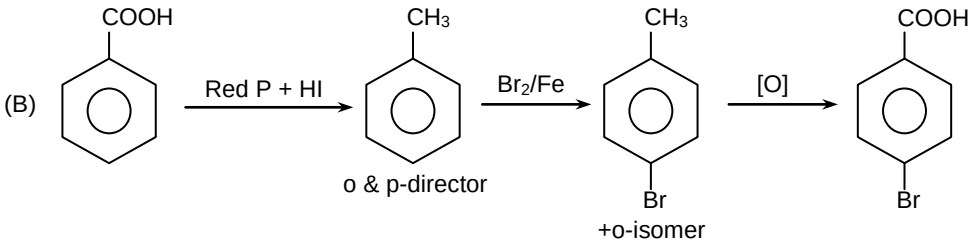
49. By which of the following methods p-bromobenzoic acid is prepared

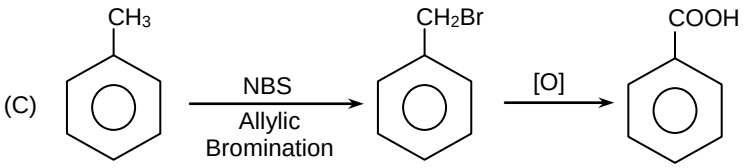


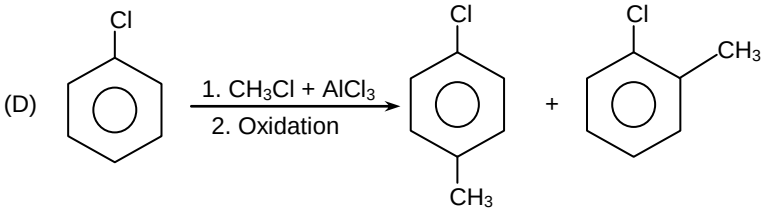
B

Sol.









50. The Lassaigne's extract is boiled with conc. HNO_3 while testing for halogens. By doing so it

a. decomposes Na_2S and NaCN, if formed
b. helps in the precipitation of AgCl
c. increases the solubility product of AgCl
d. Increases the concentration of NO_3^- ion

A