



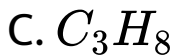
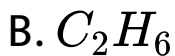
# CHEMISTRY

## BOOKS - MAXIMUM PUBLICATION

### HYDROCARBONS

#### Example

1. Which of the following cannot be prepared by Wurtz reaction?



**Answer: A**



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2. The cyclic polymerization of propyne produces \_\_\_\_\_



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3. Say TRUE of FALSE.

Calcium carbide on hydrolysis gives ethylene.



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4. 3- Hexyne reacts with Na/ liquid  $NH_3$  to produce

A. cis-3- Hexene

B. trans -3- Hexene

C. 3- Hexylamine

D. mm2- Hexylamine

**Answer: B**



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5. Choose the correct answer from the brackets given below:

1) General formula of alkene

$(C_nH_{2n}, C_nH_{2n+2})$



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6. Choose the correct answer from the brackets given below:

2) The 2 different forms of elemental carbon (Bitumen, Diamond, Charcoal, Coke, Led, Graphite)



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7. Choose the correct answer from the brackets given below:

3) Find the odd man out. Give reason

(  $C_2H_4$  ,  $C_3H_6$  ,  $C_4H_8$  ,  $C_2H_6$  )



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8. Which is not the isomer of

$CH_3 - CH_2 - O - CH_2 - CH_3$  ?

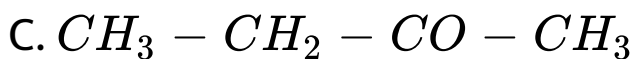
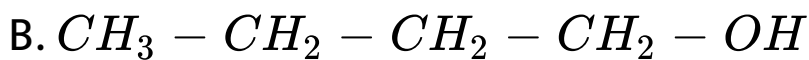
a)  $CH_3 - O - CH_2 - CH_2 - CH_3$

b)  $CH_3 - CH_2 - CH_2 - CH_2 - OH$

c)  $CH_3 - CH_2 - CO - CH_3$

d)  $CH_3 - CH(OH) - CH_2 - CH_3$

A.  $CH_3 - O - CH_2 - CH_2 - CH_3$



**Answer: C**



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**9. Bayer's reagent is ....**



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10. The electrophile attacking benzene during nitration is .....



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11. The compound that is readily nitrated is .....

a) phenol

b) Toluene

c) Ethylbenzene

d) Benzoic acid

A. phenol



B. Toluene

C. Ethylbenzene

D. Benzoic acid

**Answer: D**



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**12.** The hydrocarbon formed when Beryllium carbide is treated with water is .....



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**13.** Is there an organic compound named 2-Ethylpentane? Why? If no, write the correct answer.



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**14.** Addition of HBr to propene yields 2-bromopropane, what happens if benzoyl peroxide is added to the above reaction.



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**15.** Explain the following with necessary chemicals equations.

i) Wurtz reaction



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**16.** Explain the following with necessary chemicals equations.

Kolbe's reaction



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**17.** Explain the following with necessary chemical equations.

Ozonolysis of alkenes



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**18.** Explain the reaction between sodium metal and bromoethane in dry ether.



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**19.** Draw Sawhorse and Newman's projections of the different conformers of ethane.



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**20.** Analyse the given reactions, give the major products.

Justify your answer .

a) HBr is added to 1- Butene two products are obtained



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**21.** Analyse the given reactions, give the major products.

Justify your answer .

Action of excess chlorine with benzene in dark.



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**22.** Analyse the given reactions, give the major products.

Justify your answer .

Addition of chlorine to benzene in uv light.



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**23.** Write any two necessary condition for a compound to be aromatic.



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**24. a)** I am an unsaturated hydrocarbon.

b) My wordroot is pent.

c) My suffix is ene. The double bond lies between 2nd and 3rd carbon atoms.

d) I have a branch of methyl group on my second carbon atom. Who am I...?



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**25.** Name the product obtained when HBr is added to propene.



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**26.** Acetylene is more acidic than ethylene or ethane. Why?





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27. How will you prepare butane in the laboratory using ethyl bromide ( $CH_3CH_2Br$ ) as one of the raw materials. Write relevant equation.



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28. Addition of HBr to propene yields 2-Bromopropane, while in the presence of

Benzoyl peroxide. The same reaction Yields 1-Bromopropane. Give reason. Justify your answer.



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**29.** Three compounds are given. Benzene, m-dinitrobenzene and toluene. Identify the compound which will undergo nitration most easily and why?



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**30.** Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene:

i) In the absence of peroxide



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**31.** Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene:

In the presence of peroxide



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**32.** How will you convert :

i) Benzene to toluene



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**33.** How will you convert :

Benzene to nitrobenzene



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34. The equations for two chemical reactions are given below:



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## Exercise

1. How do you account for formation of ethane during chlorination of methane?



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2. For the following compound, write structural formula and IUPAC name for all possible isomers having the number of double or triple bond as indicated:

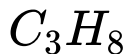
$C_4H_6$  (one double bond)



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3. For the following compounds, write structural formulas and IUPAC names for all possible isomers having the number of double

or triple bond :



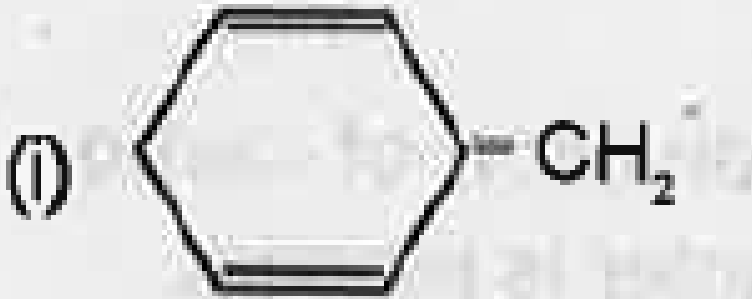
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4. What are the necessary conditions for any compound to show aromaticity?



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5. Explain why the following systems are not aromatic?



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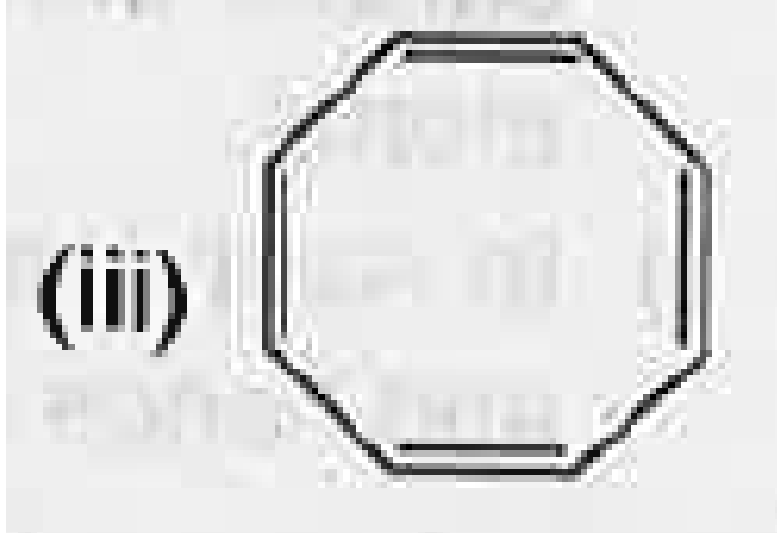
6. Explain why the following systems are not aromatic?





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7. Explain why the following systems are not aromatic?



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8. In the alkane,

$H_3CCH_2C(CH_3)_2CH_2CH(CH_3)_2$ , identify

$1^\circ$ ,  $2^\circ$ ,  $3^\circ$  carbon atoms and give the total

number of atoms bonded to each one of these





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9. What effect does branching of an alkane chain has on its melting point?



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10. Why does benzene undergo melting point increases



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**11.** Freons are known with respect to ozone layer depletion.

i) What are Freons?



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**12.** Freons are known with respect to ozone layer depletion.

ii) How can you prepare a Freon from  $CCl_4$ ?



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**13.** How will you prepare ethane by Kolbe's electrolytic method?



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**14.** Explain Markownikoff's rule for the addition reaction using a suitable example.



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**15.** A special arrangements of atoms which can be converted into one another by rotation around a C-C single bond are called conformations.

i) Represent Sawhorse and Newman projection formulae of staggered and eclipsed conformation of ethane.



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**16.** A special arrangements of atoms which can be converted into one another by rotation around a C-C single bond are called conformations.

ii) Compare the stabilities of staggered and eclipsed conformations.



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**17.** In a special condition addition of HBr to unsymmetrical alkene takes place contrary to

Markovnikov's rule .

a) What is the special rule?



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**18.** In a special condition addition of HBr to unsymmetrical alkene takes place contrary to Markovnikov's rule .

Give the mechanism of anti Markonikov's addition of HBr to propene



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19. Carbocations are formed by the heterolytic cleavage of a covalent bond.

a) What is heterolytic bond fission?



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20. Carbocations are formed by the heterolytic cleavage of a covalent bond.

b) Arrange the following carbocations in the increasing order of stability:  $(CH_3)_2CH^+$  ,  $CH_3^+$  ,  $(CH_3)_3C^+$  ,  $CH_3CH_2^+$



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21. Naphthalene is an aromatic compound.

Explain its aromaticity using Huckel's rule.



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22. Free rotation is possible with respect to a C-C bond in the case of alkanes.

a) The repulsive interaction between the adjacent bonds in a conformation is called.....



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**23.** Free rotation is possible with respect to a C-C bond in the case of alkanes.

b) Draw Newman's projections of the two conformers of ethane. Which among these is more stable? Justify.



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**24.** Free rotation is possible with respect to a C-C bond in the case of alkanes.

c) An alkene on ozonolysis followed by

reduction of the ozonide formed with zinc and water gave a mixture of ethanal and methanal.

i) Identify the alkene



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**25.** Free rotation is possible with respect to a C-C bond in the case of alkanes.

c) An alkene on ozonolysis followed by reduction of the ozonide formed with zinc and water gave a mixture of ethanal and methanal.

ii) Illustrate the above mentioned the above

mentioned reaction using the chemical equation.



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**26.** Draw the Newman's projections of the eclipsed and staggered conformations of n-butane.



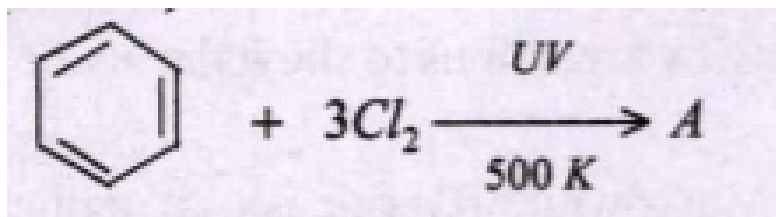
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**27.** What is Baeyer's reagent?



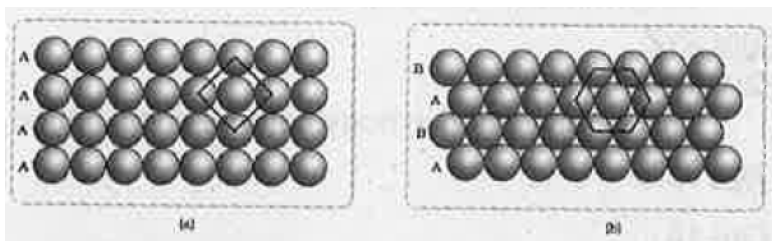
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28. Name the product A.



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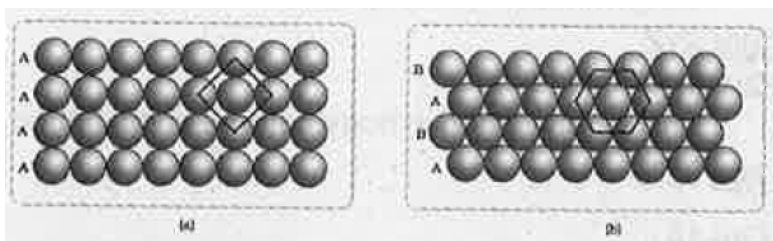
29.



Explain them.



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30.

Explain them.



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31. An alkene 'A' on ozonolysis gave two molecules of formaldehyde. Write the name of 'A' and the chemical equation of ozonolysis.



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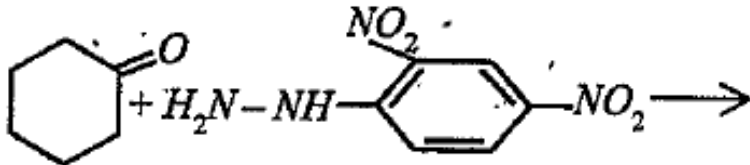
**32.** Draw the cis- and transisomers of the following compound: (i)  $\text{CHCl}=\text{CHCl}$  (ii)  $\text{C}_2\text{H}_5\text{CCH}_3 = \text{CCH}_3\text{C}_2\text{H}_5$



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**33.** Predict the products of the following reactions.





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34. Match the following columns

(i) Complete the following table by finding  $a_1, a_2, a_3, a_4, a_5, a_6, a_7$  and

$b_1, b_2, b_3, b_4, b_5, b_6, b_7$

$\theta$	$120^\circ$	$330^\circ$	$240^\circ$	$420^\circ$	$390^\circ$	$450^\circ$	$300^\circ$
sine	$a_1$	$a_2$	$a_3$	$a_4$	$a_5$	$a_6$	$a_7$
cosine	$b_1$	$b_2$	$b_3$	$b_4$	$b_5$	$b_6$	$b_7$



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**35.** Draw the sawhorse projections for eclipsed and staggered forms of a ethane molecule.



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**36.** How is alkane prepared by Kolbe's electrolytic method?

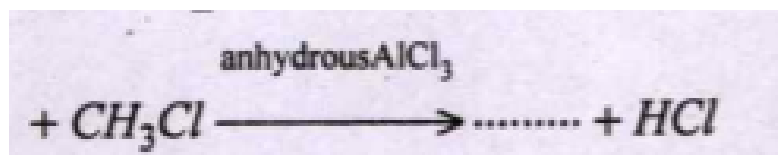


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37. Select the activating groups from the following : i)  $-NH_3$  ii)  $-SO_3H$  iii)  $-CH_3$  iv)  $-COOH$

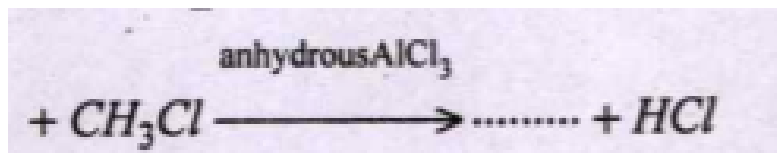
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38. Complete the following chemical equations:



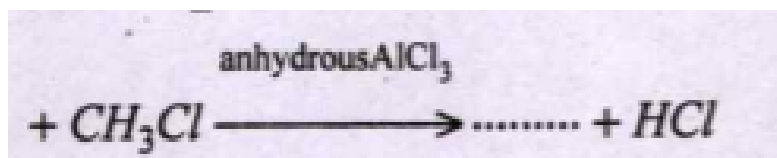
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39. Complete the following chemical equations:



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40. Complete the following chemical equations:

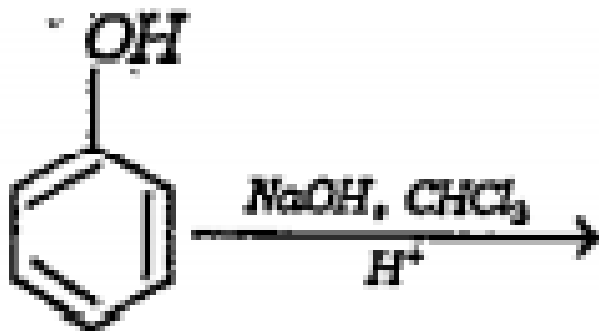


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41. Explain geometrical isomerism taking 2-Butene as an example.

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42. Complete the following:



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**43.** Controlled oxidation of alkanes in the presence of suitable catalysts give a variety of products.

Free rotation about a carbon - carbon single bond is permitted in an alkane molecule.

What are conformers? Draw the structure of the eclipsed and staggered conformers of ethane in Sawhorse and Newman projection and explain their relative stability.



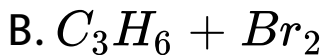
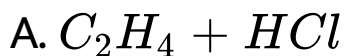
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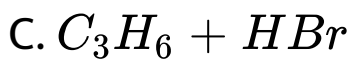
44. 1-alkynes are weakly acidic in nature. Give any two reactions to show the acidic character of ethyne.



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45. From the following, select the one in which Markownikoff's rule is best applicable





**Answer:**



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**46.** Hydrocarbons exhibit isomerism.

i) Name the type of isomerism exhibited by 2-Butene.



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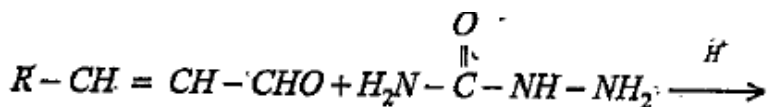
47. Hydrocarbons exhibit isomerism.

Draw the structure of the isomers of 2-Butene



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48. Predict the products of the following reactions.



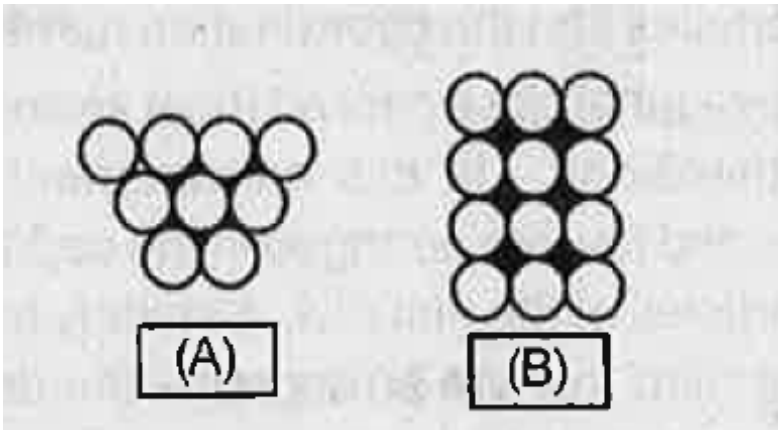
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# 49. Which statement is true

(i) Complete the following table by finding  $a_1, a_2, a_3, a_4, a_5, a_6, a_7$  and  $b_1, b_2, b_3, b_4, b_5, b_6, b_7$

$\theta$	$120^\circ$	$330^\circ$	$240^\circ$	$420^\circ$	$390^\circ$	$450^\circ$	$300^\circ$
sine	$a_1$	$a_2$	$a_3$	$a_4$	$a_5$	$a_6$	$a_7$
cosine	$b_1$	$b_2$	$b_3$	$b_4$	$b_5$	$b_6$	$b_7$

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50.

Write the names of A and B?





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51. Baeyer's reagent is used to find whether the compound is unsaturated or not. What is Baeyer's reagent?



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52. What is the product formed when ethylene is treated with Baeyer's reagent?



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53. Match the following

A	B
Circle	$ax + by + c = 0$
Parabola	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
Ellipse	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
Hyperbola	$(x - h)^2 + (y - k)^2 = 1$
	$y^2 = 4ax$



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54. Benzene and benzenoid compounds show aromatic character.

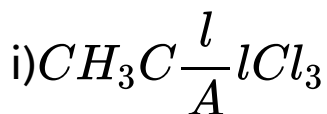
b) Suggest a method to convert Ethyne to benzene



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**55.** Benzene and benzenoid compounds show aromatic character.

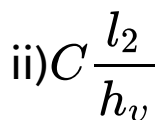
c) Give the products formed when benzene reacts with



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**56.** Benzene and benzenoid compounds show aromatic character.

c) Give the products formed when benzene reacts with



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