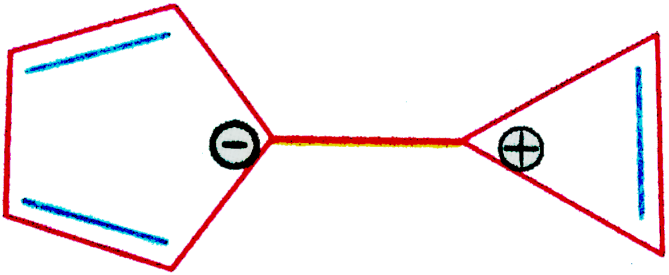
CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 11 FOR CHEMISTRY

BENZENE

W.E



1.

Explain whether the compound shown below is aromatic or not ?

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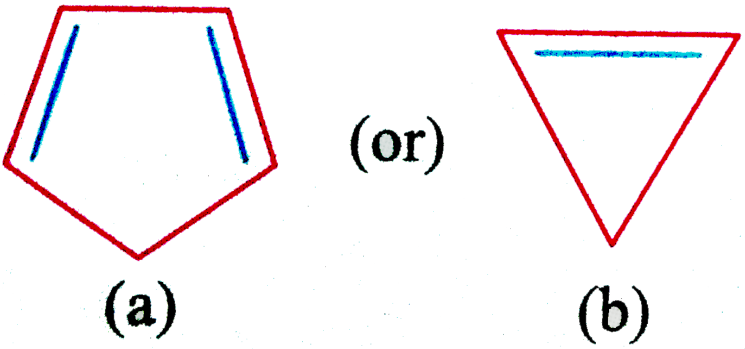

2.

Which of the following compounds is more acidic ?

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3. How would you convert the following compounds into benzene?

(i) Ethyne

(ii) Ethene

(iii) Hexane

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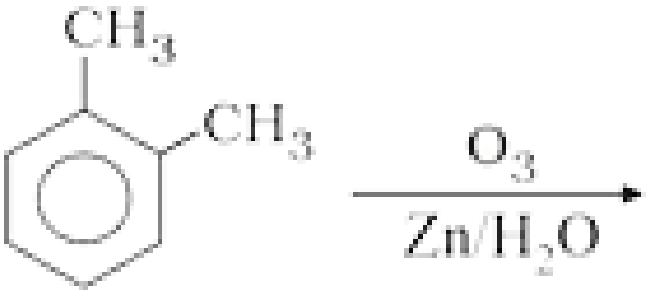
4. Which of the following products can be obtained by reductive ozonolysis of o-xylene ?



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5. What products is obtained when isobutyl chloride reacts with benzene in presence of $AlCl_3$?

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6. What is the major product obtained by nitration of m-xylene?

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7. Predict the major product of chlorination of m-dinitrobenzene.

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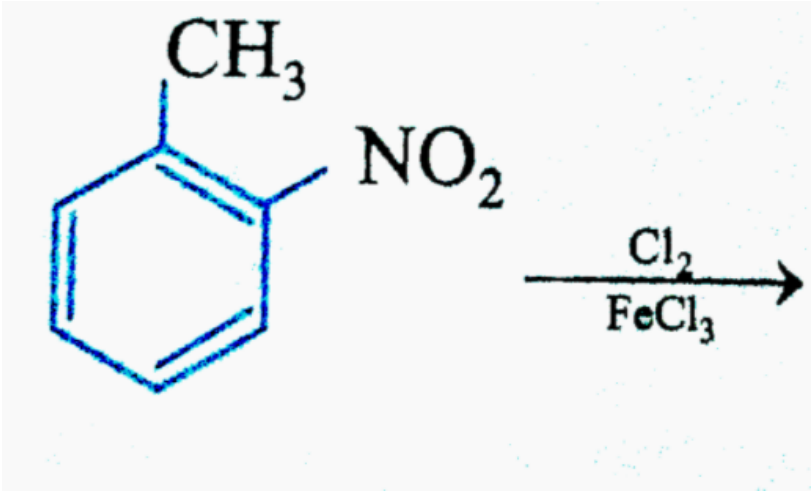

8.

Write the major product of the following reaction.

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9. How acetic acid can be converted to benzene?

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Level-1

1. Aromatic compounds give smoky flame because

A. Hydrogen percentage is more

B. Carbon percentage is more

C. Delocalisation

D. Saturation.

Answer: B

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2. Bond length of C-C in benzene

A. 1.34A^(@)`

B. $1.39A^{\circ}$

C. $1.54A^{\circ}$

D. $1.20A^{\circ}$

Answer: B

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3. Benzene is an

A. [8] annulene

B. [6] annulene

C. [12] annulene

D. [4] annulene

Answer: B

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4. The dipolemoment of benzene is

A. Zero

B. Less than p-dichloro benzene

C. Greater than p-dichloro benzene

D. Equal to that of chloro benzene

Answer: A

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5. The increase in stability and decrease in energy of aromatic compounds is due to

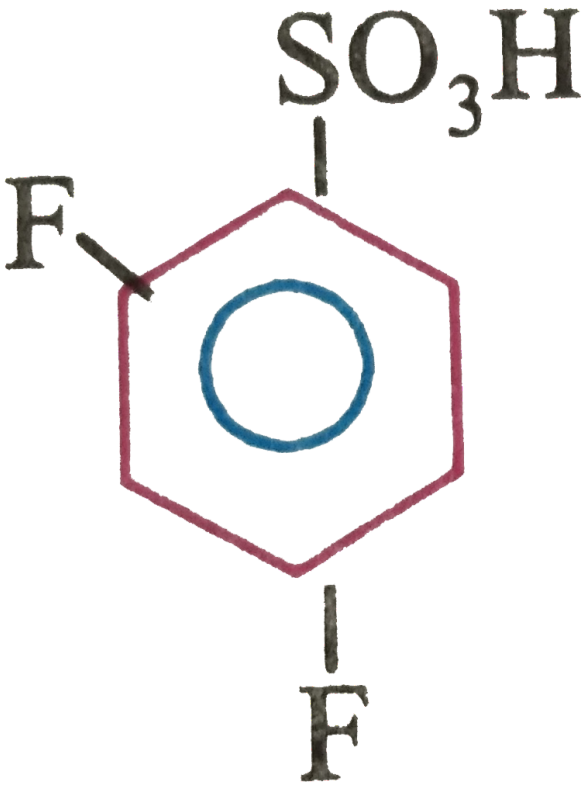
A. Localisation of pi-electrons

B. Delocalisation of sigma-electrons

C. Localisation of sigma-electrons

D. Delocalisation of pi-electrons

Answer: D



6.

IUPAC name of the following compound is

A. 2,4-difluoro-1-sulpho benzene

B. 2,4-difluoro benzene sulphonic acid

C. Benzene-2,4-difluoro sulphonic acid

D. All the above

Answer: B

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7. Benzene is ___molecule.

A. Tetrahedral

B. Planar

C. Trigonal

D. Square planar

Answer: B

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8. The resonance energy of benzene is

A. 36kcal/mol

B. 85.8kJ/mole

C. 150.48kJ/mole

D. Both 1 & 3

Answer: D

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9. Shape of cyclo octatetraene is

A. Planar

B. Tetrahedral

C. Tub shape

D. Hexagonal

Answer: C

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10. In Huckel's $(4n+2)\pi$ rule for aromaticity, 'n' represents

A. Number of carbons atoms

B. Number of rings

C. Whole number

D. Fractional number (or) integer (or) zero

Answer: C

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11. What is number of electron delocalising in benzene molecule.

A. 3

B. 6

C. zero

D. 12

Answer: B

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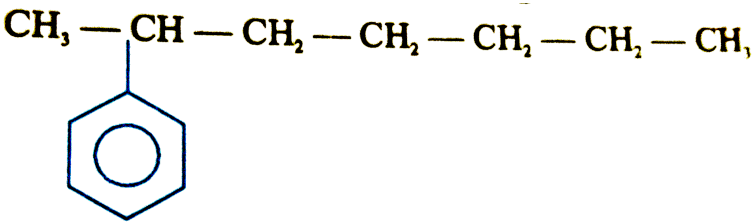
12. IUPAC name of the following compounds is



A. Heptyl benzne

B. 2-Benzyl heptane

C. 2-Phenyl heptane

D. 1-heptyl benzene

Answer: C

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13. Benzene is a resonance hybride of mainly two kekule structures. Hence

A. Half the molecules corresponds to one structure and half to the second structure

B. At low temperature benzene can be separated into two structures

C. Two structures make equal contribution to resonance hybride.

D. An individual benzene molecule changes back and forth between two structures.

Answer: C

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14. In the nitration mixture concentrated sulphuric acid is used.

A. As a sulphonating agent

B. As dehydrating agent

C. For the formation of nucleophile

D. As a solvent

Answer: B

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15. Benzene contains double bonds but does not give addition reactions because

A. Double bonds in benzene rinig are strong

B. Double bonds change their position rapidly

C. Resonance lowers the energy of benzene molecule and leads to greater stabilization

D. Benzene has cumulative double bonds.

Answer: C

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16. how many monosubstituted products can be derived from benzene

A. one

B. two

C. Three

D. Four

Answer: A

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17. Which of the following cannot form ozonide

A. Benzene

B. Ethene

C. Ethyne

D. Ethane

Answer: D

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18. Gammaxene is .. . . Isomer of benzene hexa chloride.

A. α

B. β

C. γ

D. δ

Answer: C

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19. The empirical formula of benzene and acetylene is/are

A. CH_2, CH

B. C_2H, CH_2

C. CH, CH

D. CH_3, CH_3

Answer: C

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20. Preparation of benzene from phenol is

A. Reduction

B. Oxidation

C. Addition

D. Dehydrogenation

Answer: A

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21. The true statement about benzene is

A. Because of unsaturation benzene easily undergoes addition reactions.

B. There are two types $C-C$ bonds in benzene molecule

C. There is a cyclic delocalisation of $\pi-$ electrons in benzene

D. Mono substitution of benzene gives three isomeric products.

Answer: C

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22. Which among the following is very strong o-p-directing groups?

A. $-Cl$

B. $-OR$

C. $-NH_2$

D. $-NHR$

Answer: D

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23. Lindane is also represented as

A. 6,6,6

B. BHC

C. Gammaxene

D. all of these

Answer: D

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24. The homologue of toluene is

A. Ethyl benzene

B. Methyl benzene

C. Phenol

D. Nitro benzene

Answer: A

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25. Benzen is purified by

A. Distillation

B. Fractional distillation

C. Evaporation

D. Sublimation

Answer: B

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26. Chemical name of the insecticide gammaxene is

A. DDT

B. Benzene hexa chloride

C. Chloral

D. Hexa chloro ethane

Answer: B

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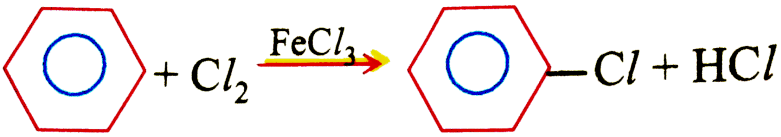
27.



In the reaction The attacking species is

A. Cl_2

B. Cl^+

C. Cl^-

D. $FeCl_4^-$

Answer: B

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28. Which one among the following gives a dicarbonyl compound with O_3 followed by reduction with zinc and water.

A. C_2H_6

B. C_6H_6

C. C_2H_2

D. Both 2 & 3

Answer: D

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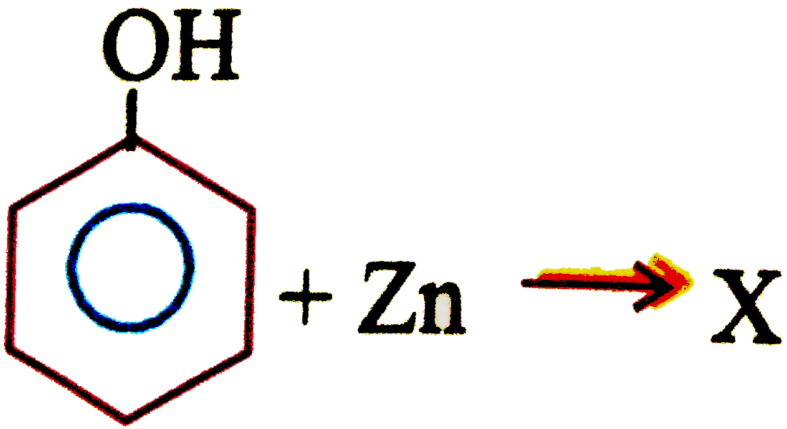

29.

Here the product X is used as a

A. Insecticide

B. For welding purpose

C. For dry cleaning

D. Artifical ripening of fruits

Answer: C

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30. C_6H_6 is very good industrial solvent for

A. Oil

B. Fat

C. Rubber

D. All

Answer: D

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31. $-COOH$ group in electrophilic substitution directs the incoming groups to

A. o-position

B. p-position

C. m-position

D. o-and p-position

Answer: C

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32. All the common m-directig group make the benzene ring towards electrophilic substitution reactions

A. dectivate

B. Activate

C. Both 1 & 2

D. neutral

Answer: A

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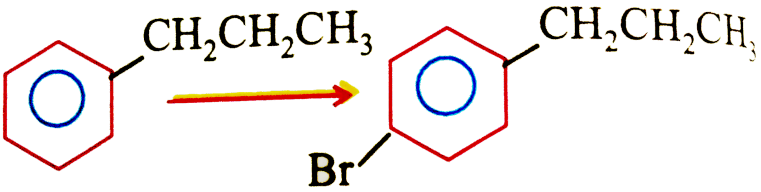

33.

The conversion

Can be effected using

A. Br_2 / CCl_4

B. Br_2 / H_2O

C. Br_2 / Fe

D. $Br_2 /$ benzoyl peroxide

Answer: C

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34. Nitration mixture is

A. $1:1$ of conc HNO_3 and conc HCl.

B. 1 : 1 of conc HNO_3 and conc H_2SO_4

C. 1 : 1 of conc HNO_2 and conc. H_2SO_4

D. 1 : 10 of conc. H_2SO_4 and conc. HNO_3

Answer: B

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35. Benzene reacts with___to yield acetophenone

A. $CH_3COCl + AlCl_3$

B. $C_6H_5COCl + AlCl_3$

C. $R - COCl + AlCl_3$

D. $C_2H_5COCl + AlCl_3$

Answer: A

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36. Which of the following behaves as a saturated compound?

A. C_2H_4

B. C_2H_2

C. C_3H_6

D. C_6H_6

Answer: D

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Level-2 (CW)

1. Which of the following meet the requirements of the huckel rule

A. Naphthalene

B. Cyclohexane

C. 1,3,5,7-Cyclooctatetraene

D. 1,3-Cyclobutadiene

Answer: A

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2. The ratio of sigma and pi bonds in benzene is

A. $4:1$

B. $2:3$

C. $6:1$

D. $1:1$

Answer: A

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3. Benzene does not undergo polymerisation due to

A. Cyclic nature

B. High %C

C. Resonance

D. Steric effect

Answer: C

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4. Formation of benzene fron acetylene is

A. Trimerisation

B. Tetramerisation

C. Dimerisation

D. Condensation.

Answer: A

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5. During nitration of benzene withnitrating mixture, HNO_3 acts as

A. Base

B. Acid

C. Reducing agent

D. Catalyst

Answer: A

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6. Benzene reacts with . . . . To yield benzophenone.

A. $CH_3COCl + AlCl_3$

B. $C_6H_5COCl + AlCl_3$

C. $R - COCl + AlCl_3$

D. $C_2H_5COCl + AlCl_3$

Answer: B

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7. The end product of the reaction

$C_6H_6 + Cl_2 \xrightarrow{\text{Sunlight}}$? Is

A. C_6H_5Cl

B. $O - C_6H_4Cl_2$

C. $C_6H_6Cl_6$

D. $P - C_6H_4Cl_2$

Answer: C

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8. Which of the following species is expected to yield maximum percentage of meta substitution product.

A. $ArCH_3$

B. $ArCH_2Cl$

C. $ArCHCl_2$

D. $ArCCl_3$

Answer: D

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9. The order of reactivities towards ESR of the various species

A. $-O^- > -OH > -OCOCH_3 > -COCH_3$

B. $-OH > -O^- > -OCOCH_3 > -COCH_3$

C. $-OH > -O^- > -COCH_3 > -OCOCH_3$

D. $-O^- > -COCH_3 > -OCOCH_3 > -OH$

Answer: A

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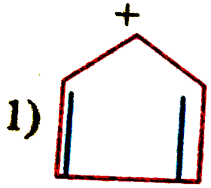
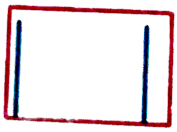
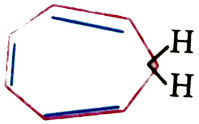
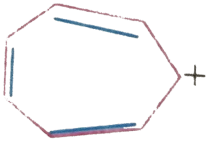
Level-3

1. Which of the following is expected to aromatic

A. 1) 

B. 2) 

C. 3) 

D. 4) 

Answer: D

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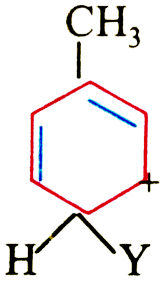
2. which of the following carbon is expected to be least stable.

A. 1) 

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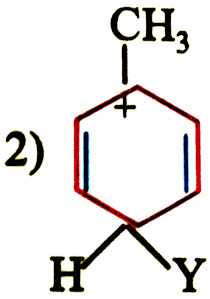
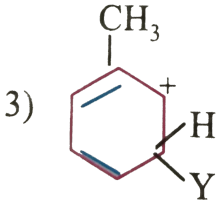
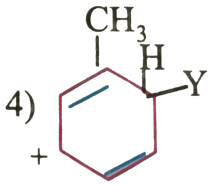


C.



D.



Answer: C

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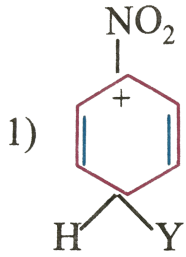
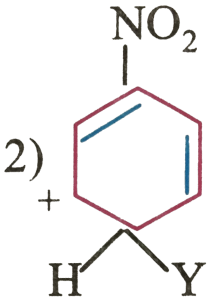
3. Which of the following carbocation is expected to be most stable

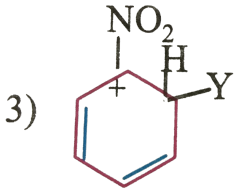
A.



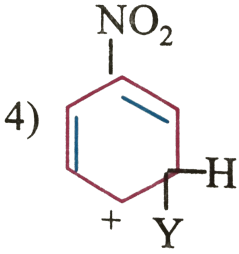
B.



C.



D.



Answer: D

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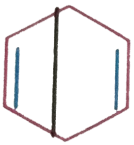
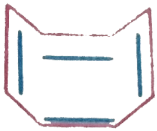
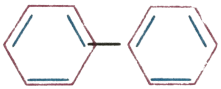
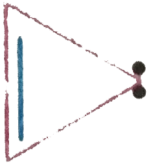
4. Which of the following structure will not have 4π electrons

A. 1) 

B. 2) 

C. 3) 

D. 4) 

Answer: D

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5. $CaC_2 \xrightarrow{H_2O} A \xrightarrow{\text{Red tube hot}} B \xrightarrow[CH_3Cl]{AlCl_3} C$

In this sequece B and C are.

A. Benzene & acetylene

B. Toluene & Benzene

C. Benzene & Toluene

D. Toluene & acetylene

Answer: C

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6. $C_2H_2 \xrightarrow{\text{Red hot tube}} A \xrightarrow{\text{fuming } H_2SO_4} B$ then 'B' is

A. Benzene

B. Toluene

C. Chloro benzene

D. Benzene sulphonic acid

Answer: D

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7. $A \xrightarrow{\text{soda lime}} C_6H_6 \xrightarrow{Cl_2, hv} B$, In this reaction A and B are respectively.

A. Phenol, chlorobenzene

B. Chlorobenzene, lindane

C. Sodium benzoate, BHC

D. $C_2H_2 \& BHC$

Answer: C

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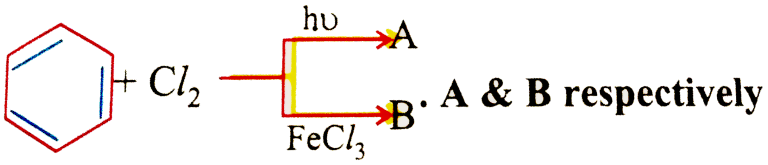
8. 

. A & B respectively

A & B respectively are

A. Hexachlorocyclohexane & C_6H_5Cl

B. Chlorobenzene & Hexachlorocyclohexane

C. o- and p- Dichlorobenzene & chlorobenzene

D. Chlorobenzene & $C_6H_5Cl_6$

Answer: A

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9. The descending order of reactivity of C_2H_6, C_2H_4, C_2H_2 and C_6H_6 towards addition reaction is

A. $C_2H_4 > C_2H_2 > C_6H_6 > C_2H_6$

B. $C_2H_2 > C_2H_4 > C_6H_6 > C_2H_6$

C. $C_6H_6 > C_2H_6 > C_2H_4 > C_2H_2$

D. $C_2H_6 > C_2H_4 > C_2H_2 > C_6H_6$

Answer: A

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10. A new carbon-carbon bond is formed in

A. Cannizzaro's reaction

B. Friedel-craft reaction

C. Clemmenson reduction

D. All the above

Answer: B

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11. $X \xrightarrow[\text{Boil}]{Dil.\,H_2SO_4} Y \xleftarrow[\Delta]{Zndust} Q$ where 1 mole Y on ozonolysis yields three moles of ethane-1,2-dial, X and Q respectively are

A. Napthalene,phenol

B. Benzene sulphonic acid, nitrobenzne

C. Benzene sulphonic acid, phenol

D. Thenol, Toluene

Answer: C

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12. In which of the following reaction, aromatic character is retained?

A. $C_6H_6 \xrightarrow{H_2/Ni} X$

B. $C_6H_6 \xrightarrow[Zn/H_2O]{O_3} Y$

C. $C_6H_6 \xrightarrow[AlCl_3]{CH_3COCl} Q$

D. $C_6H_6 \xrightarrow[\text{light}]{Cl_2} R$

Answer: C

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13. Number of $\sigma sp^2 - sp^2$ bonds present in a molecule of X in the process $C_6H_6 \xrightarrow[200^\circ C]{H_2/Ni} X$ is

A. 6

B. 3

C. 12

D. Zero

Answer: D

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14. What is 'X' in the following reaction?

A. $C_6H_5C \equiv C - H \xrightarrow[dil.\ H_2SO_4]{Hg^{+2}} X$

B. $C_6H_5 - COCH_3$

C. $C_6H_5 - CH_2CHO$

D. $C_6H_5 - CHO$

Answer: A

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15. Fluorobenzene (C_6H_5F) can be synthesized in the laboratory .

A. By heating phenol with HF and KF

B. From aniline by diazotisation followed by heating the diazonium saltw if HBF_4

C. By direct fluorination of benzene with F_2 gas

D. By reacting bromo benzene with NaF solution.

Answer: B

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16. The electrophile in Acetylation of Benzene is

A. $\overset{\oplus}{R}$

B. $R\overset{\oplus}{C}O$

C. $\overset{\oplus}{C}_6H_5$

D. $N\overset{\oplus}{O}_2$

Answer: B

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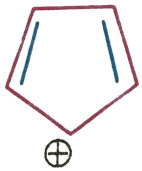
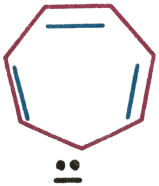
17. Four structures are given in option (1) to (4). Examine them and select the aromatic structure.

A. 1) 

B. 2) 

C. 3) 

D. 4) 

Answer: C

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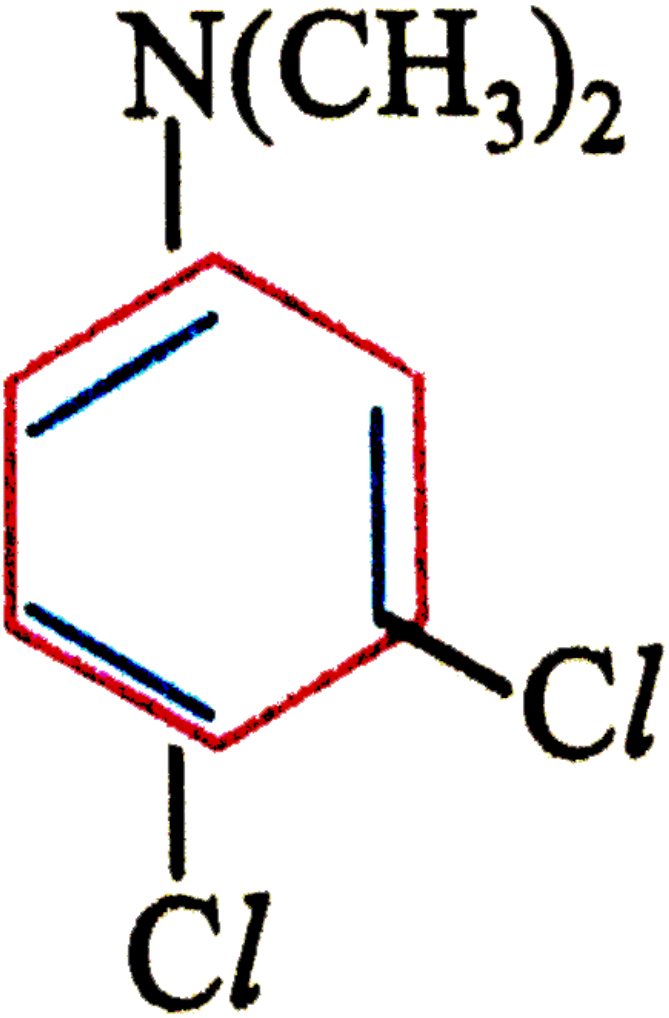
18. Which of the following is the correct IUPAC name of the



compound

A. 1,2-dichloro-4-(N,N-dimethyl) aniline

B. Dimethyl-(3,4-dichlorophenyl) amine

C. 3,4-dichloro-N,N-dimethyl aniline

D. N,N-dimethylamino-3,4-dichlorobenzene

Answer: C

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19. Three mole of glyoxal are obtained by the ozonolysis, followed by hydrolysis (in presence of Zn) of

A. C_2H_2

B. C_2H_4

C. C_6H_6

D. C_6H_{12}

Answer: C

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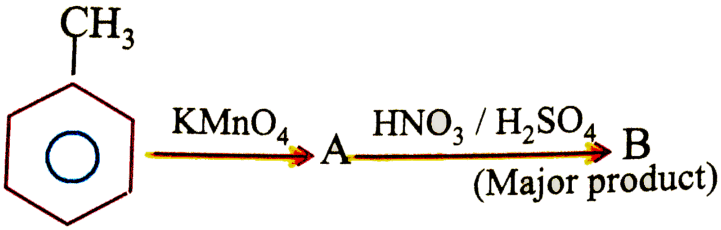
20. 

the product B is

A. 3-Nitrobenzoic acid

B. 3-Nitrotoluene

C. 4-Nitrotoluene

D. 4-Nitrobenzoic acid

Answer: A

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21. Among the following, the compound that can be most readily sulphonated is:

A. Benzene

B. Methoxy benzene

C. Toulene

D. Chloro benzene

Answer: B

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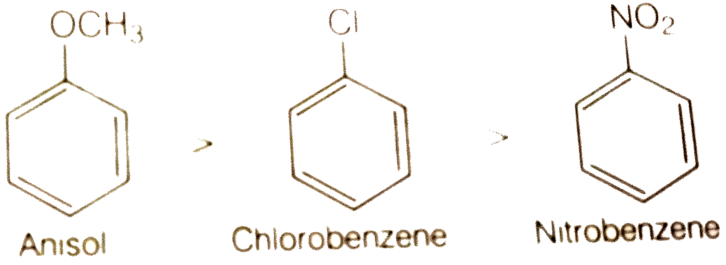
22. Arrange the following set of compounds in the order of their decreasing relative reactivity with an electrophile . Give reason.

following order



A. Igt IIgt III

B. I=II=III

C. IIt IIIt III

D. Igt IIIt III

Answer: A

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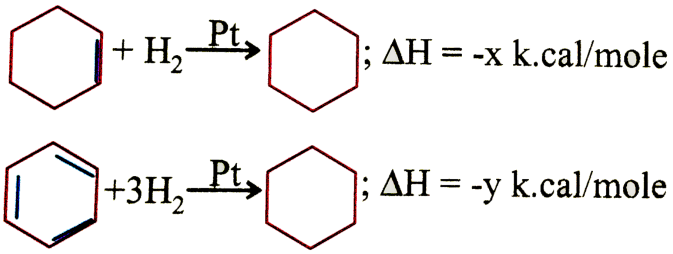
23.



The correct relation among the following is

A. $x = y$

B. $y = 3x$

C. $3x - y = 6k.\ cal$

D. $x - 3y = 36k.\ cal$

Answer: C

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Level-4

1. Assertion (A) The compound tetraene has the following structural formul.

It is cyclic and has conjugated 8π-electron system but it is not an aromatic compound.

Reason (R) $(4n+2)\pi$ electrons rule does not hold good and ring is not planar.

A. S-I & S-II are correct, S-II is corret explanation of S-I

B. S-I & S-II are correct, S-II is not correct explanation of S-I

C. S-I is true but S-II is false

D. S-I is false but S-II is true.

Answer: A

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2. S-I: Toluene on Friedel craft's methylation gives o- and p-xylene

S-II: CH_3-group bonded to benzene ring increase electron density at o- and p- position.

A. S-I & S-II are correct, S-II is corret explanation of S-I

B. S-I & S-II are correct, S-II is not correct explanation of S-I

C. S-I is true but S-II is false

D. S-I is false but S-II is true.

Answer: A

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3. S-I: Nitration of benzene with nitric acid requires the use of concentrated sulphuric acid

S-II: The mixture of concentrated sulphuric acid and concentrated nitric acid produces the electrophile, nitronium ion.

A. S-I & S-II are correct, S-II is corret explanation of S-I

B. S-I & S-II are correct, S-II is not correct explanation of S-I

C. S-I is true but S-II is false

D. S-I is false but S-II is true.

Answer: A

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4. Assertion: Bromobenzene upon reaction with Br_2 / Fe gives 1,4-dibromobenzene as the major product

Reason In bromobenzene the inductive effect of the bromo group is more dominant than the mesomeric effect in directing the incoming electrophile .

A. S-I & S-II are correct, S-II is corret explanation of S-I

B. S-I & S-II are correct, S-II is not correct explanation of S-I

C. S-I is true but S-II is false

D. S-I is false but S-II is true.

Answer: C

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5. S-I: Both benzene & ethyne give same product on ozonolysis.

S-II: Ethyne & benzene possess same emperical formula.

A. S-I & S-II are correct, S-II is corret explanation of S-I

B. S-I & S-II are correct, S-II is not correct explanation of S-I

C. S-I is true but S-II is false

D. S-I is false but S-II is true.

Answer: B

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6. For an electrophilic substitution reaction , the presence of a halogen atom in the benzene ring .....

A. deactivates the ring by inductive effect

B. deactivates the ring by resonance

C. increases the charge density at ortho and para position relative to meta position by resonance

D. directs the incoming electrophile to meta position by increasing the charge density realtive to ortho and para position.

Answer: A::C

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7. In an electrophilic substitution reactitution reaction of nitrobenzene, the presence of nitro group.....

A. deactivates the ring by inductive effect

B. activates the ring by inductive effect

C. Decrease the charge density at ortho and para position of the ring relative to meta position by resonance.

D. Increases the charge density at meta position relative to the ortho and para positions of the ring by resonance.

Answer: A::C

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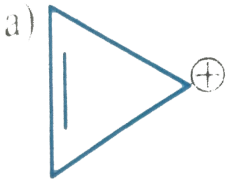
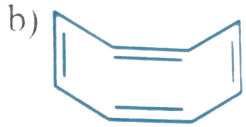
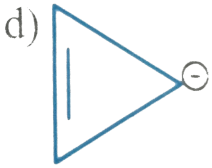
8. Four structures are given in options (a) to (d) . Examine them and select the aromatic structures.

A. 

B. 

C. 

D. 

Answer: A::C

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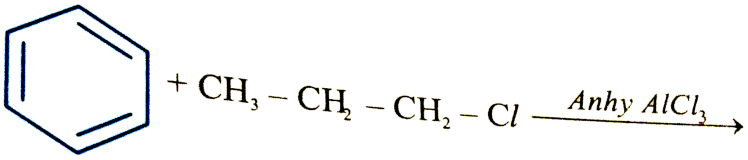
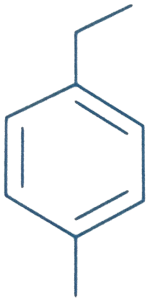
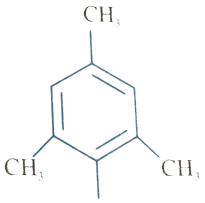
9. What will be the product obtain as a result of the following reaction?



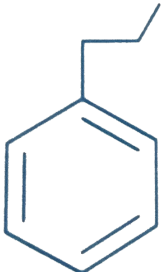
A. a)



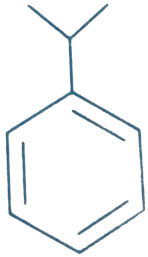
B. b)



C. c)



D. d)



Answer: D

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10. p-nitro bromobenzene

$$\xrightarrow{Sn-HCl} A \xrightarrow[(ii)\ .H_3PO_2]{(i)\ .NaNO_2+HCl,0-5^\circ C} (B) \xrightarrow[\Delta]{NaNH_2} (C) \xrightarrow{KMnO_4} (D) \xrightarrow{Br_2/Fe}$$

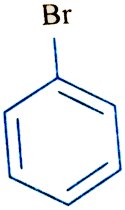
m-nitrobromobenzene

Find out products.

a) A is

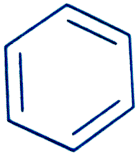
A.

b) B is

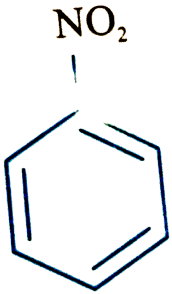


B.

c) C is



C.



D.

Answer: B::D

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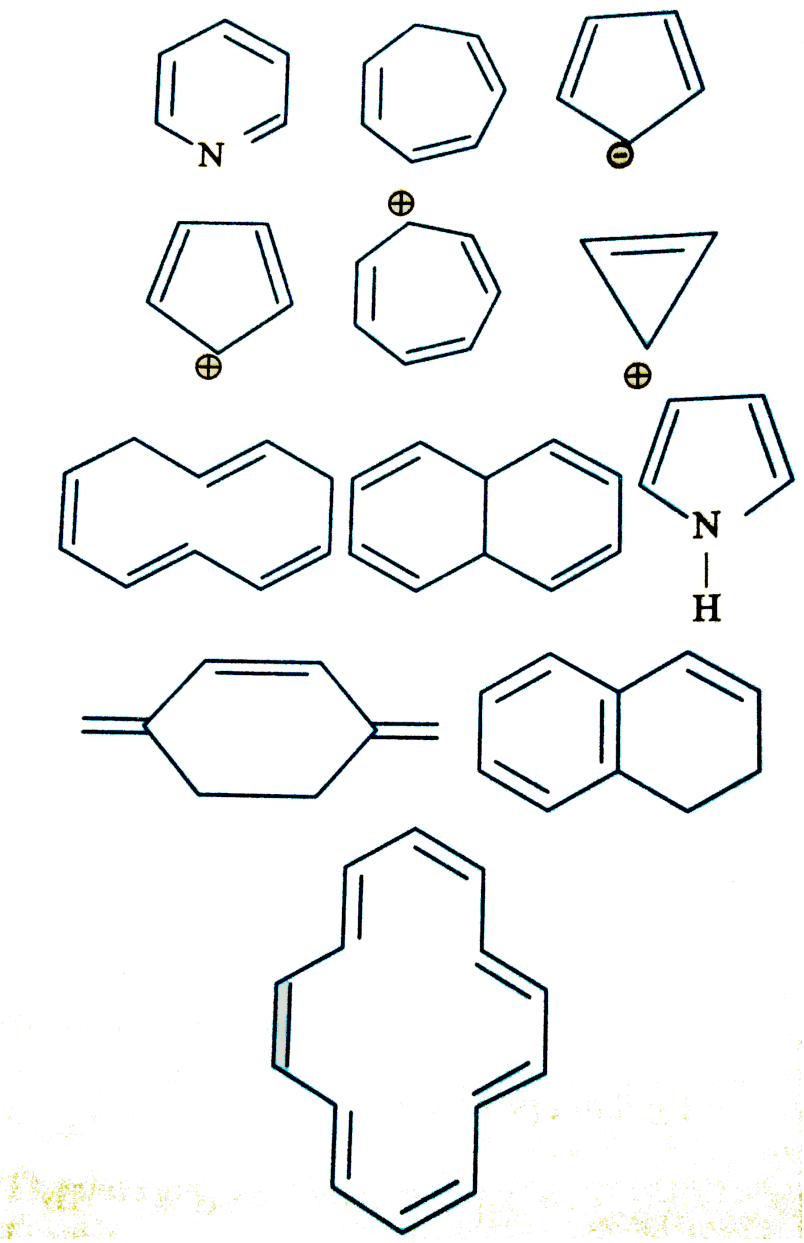
11. How many of the following compound are aromatic.



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12. On the basis of molecular orbital treatment of various aromatic compound, it has been observed that an aromatic compound must fulfil the following theoritical requirements It must have an uninterrupted cyclic cloud of π-electrons above and below the plane of the molecule (often called as π-cloud). Let us look what does this mean?

(i). for the π-cloud to be cyclic, the molecule must be cyclic.

(ii). For the π-cloud to be uninterrupted, every atom int he ring must have a p-orbital iii). for the π-cloud to be fomred, each p-orbital must be able to overlap with the p-orbitals on either side of it. therefore, the molecule must be planar.

Q. Cyclo-octatetraene is:

A. Aromatic

B. Anti-aromatic

C. Both 1 and 2

D. Non-aromatic

Answer: D

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13. On the basis of molecular orbital treatment of various aromatic compound, it has been observed that an aromatic compound must fulfil the following theoritical requirements It must have an uninterrupted cyclic cloud of π-electrons above and below the plane of the molecule (often called as π-cloud). Let us look what does this mean?

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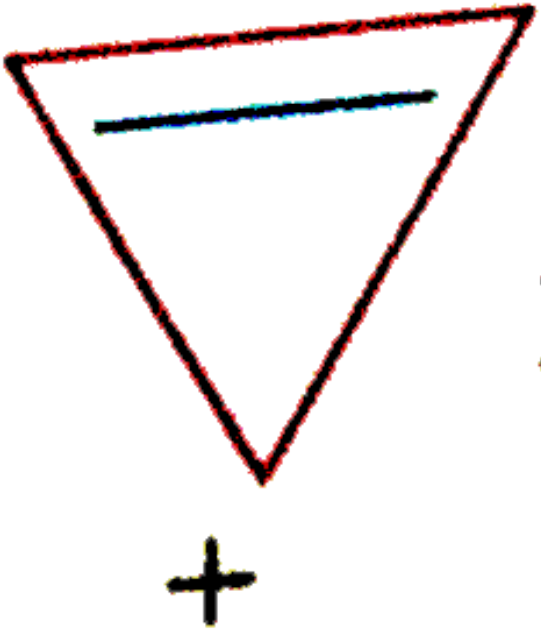

is:

Q.

A. Aromatic

B. Anti-aromatic

C. Non-aromatic

D. All the above

Answer: A

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14. On the basis of molecular orbital treatment of various aromatic compound, it has been observed that an aromatic compound must fulfil the following theoritical requirements It must have an uninterrupted cyclic cloud of π-electrons above and below the plane of the molecule (often called as π-cloud). Let us look what does this mean?

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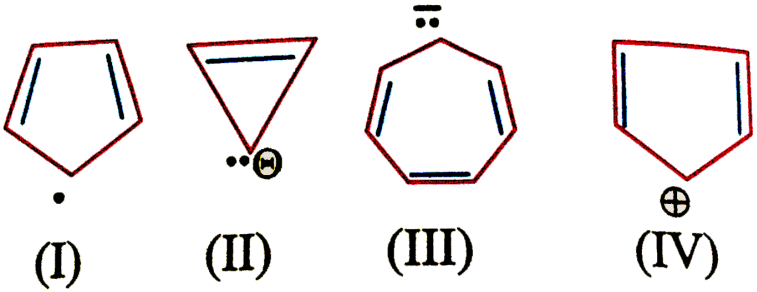
Q. Which of the following structures is not aromatic?



A. I & II

B. II & IV

C. IV

D. All the four

Answer: D

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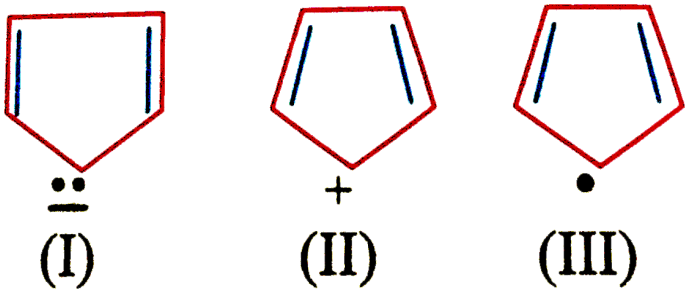
15. On the basis of molecular orbital treatment of various aromatic compound, it has been observed that an aromatic compound must fulfil the following theoritical requirements It must have an uninterrupted cyclic cloud of π-electrons above and below the plane of the molecule (often called as π-cloud). Let us look what does this mean?

(i). for the π-cloud to be cyclic, the molecule must be cyclic.

(ii). For the π-cloud to be uninterrupted, every atom int he ring must

have a p-orbital iii). for the π-cloud to be fomred, each p-orbital must be able to overlap with the p-orbitals on either side of it. therefore, the molecule must be planar.

Q. 

The stability order of the three compounds

A. Igt IIgt III

B. Igt IIIgt II

C. Igt II=III

D. I=IIIgt II

Answer: B

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List - A (Molecule)	List - B (Pure and hybrid orbit are involved)
A) C_2H_6	a) 12, 18
B) C_2H_4	b) 6, 4
C) C_2H_2	c) 6, 6
D) C_6H_6	d) 6, 8

16.

A. $\begin{matrix} A & B & C & D \\ a & b & c & d \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ b & c & d & a \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ c & d & b & a \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ d & c & b & a \end{matrix}$

Answer: D

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17. Match the following reactants in column I with the corrosponding reaction products in column II.

Column- I

A) $Benzene + Cl_2 \xrightarrow{AlCl_3}$

B) $Benzene + CH_5Cl \xrightarrow{AlCl_3}$

C) $Benzene + CH_3COCl \xrightarrow{AlCl_3}$

D) $Toluene \xrightarrow{KMnO_4 / NaOH}$

Column- II

a) Benzoic acid

b) Methyl phenyl ketone

c) Toluene

d) Chlorobenzene

(e) Benzene hexachloride

the Correct match is

A. $\begin{matrix} A & B & C & D \\ a & b & c & d \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ b & c & d & a \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ c & d & b & a \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ d & c & b & a \end{matrix}$

Answer: D

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Level-1 (H.W)

1. Cyclo butadiene is

A. Aromatic

B. Aliphatic

C. anti aromatic

D. heterocyclic

Answer: C

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2. What is the electrophile in the nitration of benzene

A. $\overset{+}{N}O_2$

B. $\overset{+}{N}O$

C. NO

D. $\overset{*}{N}O_2$

Answer: A

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3. Carbon-carbon bond length is same in

A. Butene-1

B. Benzene

C. Butene-2

D. Propyne-1

Answer: B

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4. $C_6H_4(CH_3)_2$ is present in how many isomeric forms (benzene derivatives).

A. 1

B. 2

C. 3

D. 4

Answer: C

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5. With which one of the following reagents benzene does not undergo substitution reaction

A. Fuming sulphuric acid

B. Nitration mixture

C. Chlorine in presence of light

D. Acyl halide in presence of $AlCl_3$

Answer: C

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6. Which of the following product is not possible in the ozonolysis of methyl benzene.

A. $CH_3 - CO - CHO$

B. $OHC - CHO$

C. $CH_3 - CO - CO - CH_3$

D. all the above

Answer: C

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7. $C_6H_5COONa \xrightarrow{x} C_6H_6$

Find the suitable reagent (x) for the above conversion.

A. $NaOH + Na_2CO_3$

B. $NaOH + CaO$

C. Zn

D. Anhy $AlCl_3$

Answer: B

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8. Gammaxene is .

A. BHC

B. Benzene Hexa Chloride

C. Lindane

D. All the above

Answer: D

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9. Which among the following is the strongest ortho-para directing group?

A. $-OH$

B. $-Cl$

C. $-OCH_3$

D. $-CH_3$

Answer: A

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10. Alkyl groups are o- and p- directing mainly due to

A. Resonance

B. Inductive effect

C. Resonance effect through hyper conjugation

D. All of these

Answer: C

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11. Which of the following statement is not true for benzene

A. It is planar molecule

B. All $C-C$ bond lengths are equal

C. The resonance energy is 36 kcal/mole

D. it contains three localised pi bonds.

Answer: D

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Level-2 (H.W)

1. Identify the aromaic species in the following

A. Tetra hydro furan

B. Pyridine

C. Cyclopenta dienyl anion

D. both 2 & 3

Answer: D

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2. The ratio of the number of hybrid and pure orbitals C_6H_6 is

A. $3:2$

B. $2:3$

C. $1:1$

D. $4:3$

Answer: A

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3. Which fo the following does not decolourise the Baeyer's reagent.

A. C_2H_4

B. C_6H_6

C. C_2H_2

D. All

Answer: B

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4. Hydrolysis of benzene sulphonic acid with super heated steam gives

A. Phenol

B. Benzene

C. Sulphuric acid

D. Both 2 & 3

Answer: D

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5. Benzene on treatment with a mixture of conc. HNO_3 and con. H_2SO_4 at 373K gives

A. Nitrogenzene

B. m-dinitrobenzene

C. o-dinitrobenzene

D. p-dinitrobenzene

Answer: B

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6. The function of anhydrous $AlCl_3$ in friedel-Crafts' reaction is to

A. Absorb water

B. Absorb HCl

C. Produce electrophile

D. Produce nucleophile

Answer: C

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7. Addition of Cl_2 or Br_2 (in the presence of sunlight) to the benzene follow

A. Free radical addition

B. Electrophilic addition

C. Nucleophilic addition

D. Electrophilic substitution

Answer: A

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8. A group which deactivates the benzene ring towards electrophilic substitution but directs the incoming group towards o- and p-position is

A. $-NH_2$

B. $-Cl$

C. $-NO_2$

D. $-C_2H_5$

Answer: B

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9. Which of the following is most powerful meta directing group.

A. $-NO_2$

B. $-SO_3H$

C. $-CHO$

D. $-COOH$

Answer: A

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10. Carcinogenic pollutants are formed on incomplete combustion of

A. Tobaco

B. Coal

C. Pertroleum

D. All the above

Answer: D

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11. Benzene and polynuclear hydrocarbons containing more than two benzene rings fused together are

A. Toxic

B. Posses carcinogenic property

C. Causes cancer

D. All the above

Answer: D

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12. Among the followig, carcinogenic pollutant is

A. 1,2,-benzpyrene

B. 1,2,5,6-Dibenzathracene

C. 3-methyl chlolanthrene

D. All the above

Answer: D

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Level-5

1. Toluene on oxidation with dilute HNO_3 gives

A. Benzaldehyde

B. phenol

C. Nitrotoluene

D. Benzoic acid

Answer: D

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2. The reaction of toluene with CI_2 in presence of $FeCI_3$ gives predominantly

A. Benzoyl chloride

B. m-chlorotoluene

C. Benzyl chloride

D. o-chloroluene and p-chlorotoluene

Answer: D

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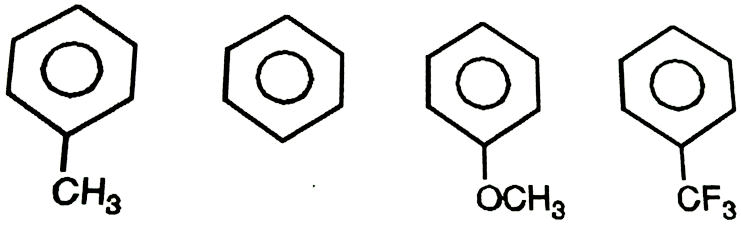
3.



I II III IV

The correct arrangement for decreasing order of electrophilic substitution reactions .

A. IIIgtIgtIIgtIV

B. IVgtIgtIIgtIII

C. IIIgtIVgtIIgtI

D. IIgtIVgtIIIgtI

Answer: A

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4. The correct order of reactivity towards the electrophilic substitiution of the compounds aniline(I),benzene(II) and nitro-benzene(III) is

A. IgtIIgtIII

B. IIIgtIIgtI

C. IIgtIIIgtI

D. IltIIgtIII

Answer: A

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5. Write the major product of the following reaction

$$C_6H_5CH_2CH_3 \xrightarrow[NaCN]{Br_2 / \Delta}$$

A. $C_6H_5 - \underset{\underset{CN}{|}}{CH} - CH_3$

B. $C_6H_5 - CH_2 - CH_2 - CN$

C. $o - (CN)C_6H_4CH_2CH_3$

D. $m - (CN)C_6H_4CH_2CH_3$

Answer: A

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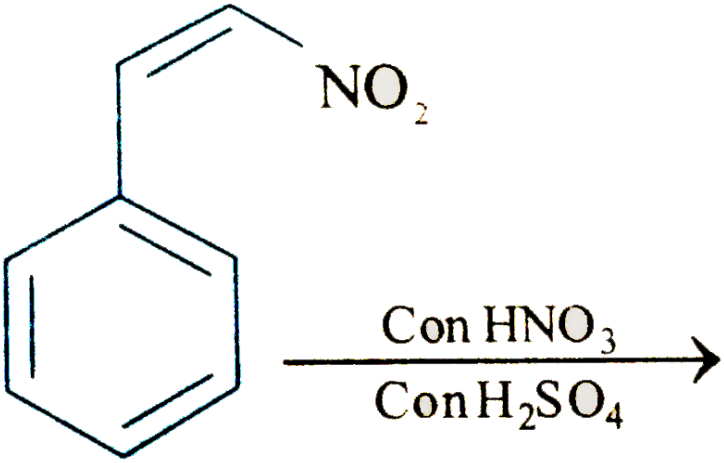
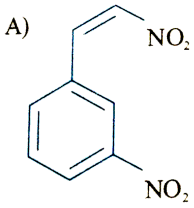
6. Oxidizing agent required for these conversion are,

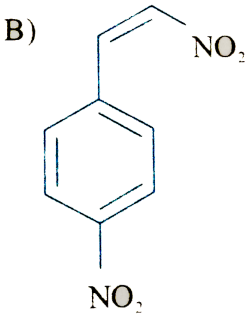


A)



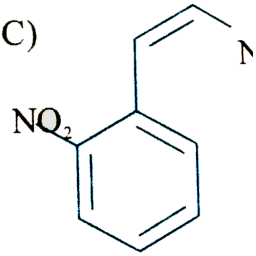
A.

B)



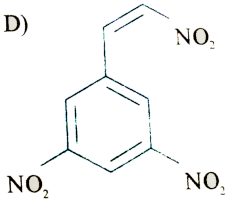
B.

C)



C.

D)



D.

Answer: B

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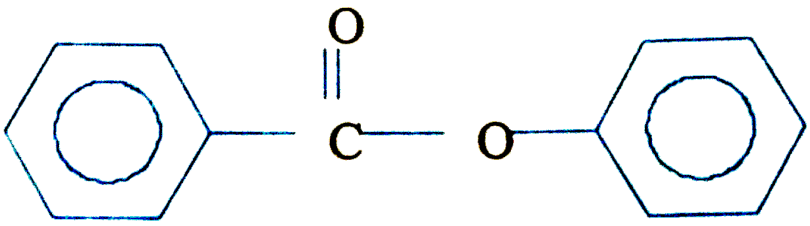
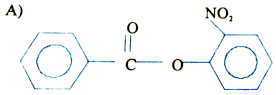
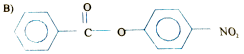
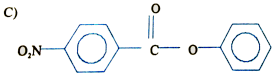
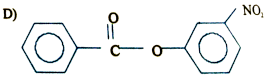
7. Which of the following is major product for the mono nitration of phenyl benzoate,



A. 

B. 

C. 

D. 

Answer: B

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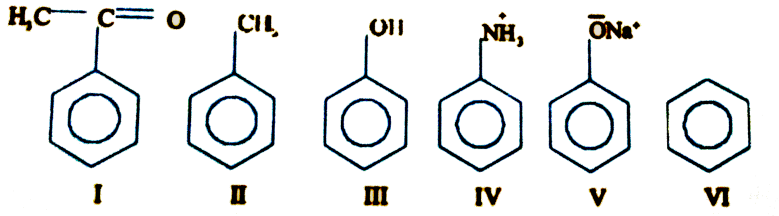
8. 

The correct of rate of reaction of the following compounds with E^+ will be

A. $II > VI > III > V > I > IV$

B. $IV > I > IV > VI > II > III$

C. $V > II > III > VI > I > IV$

D. $V > III > II > VI > I > IV$

Answer: D

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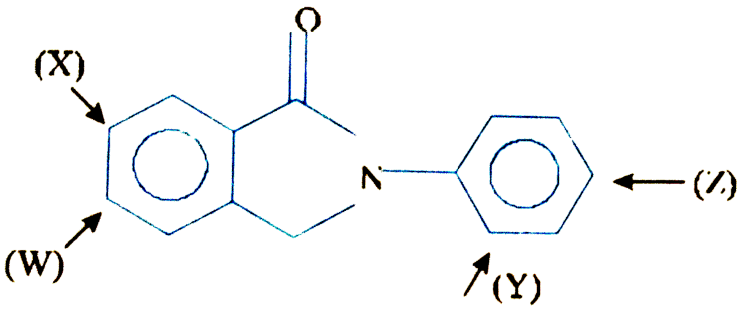
9. 

Which position gives major product when E^+ attack the following compound

A. W and B

B. X

C. Y

D. Z

Answer: D

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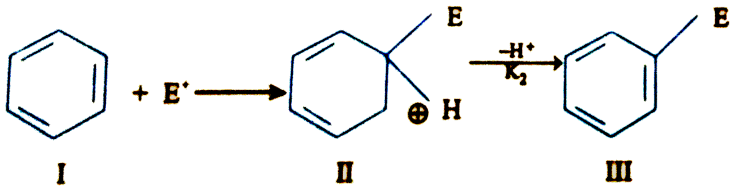
10. 

The mechanism of an electrophilic substitution reaction is

Which of the following is not ture.

A. Increasing the resonance of II will increases rate of reaction

B. increasing the density of electron in I will increase the rate of reaction.

C. Treatment of base in step-II will increase the rate

D. Temperature increasing will accelerate the rate of reaction.

Answer: C

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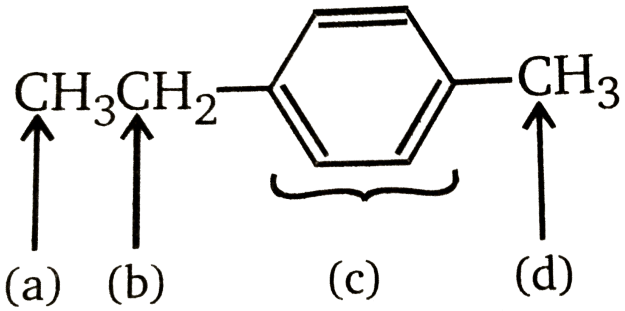
11. Which of the following hydrogens is most easily abstracted on reaction with bromine free radicals, $Br^{\cdot}$?



A. a

B. b

C. c

D. d

Answer: B

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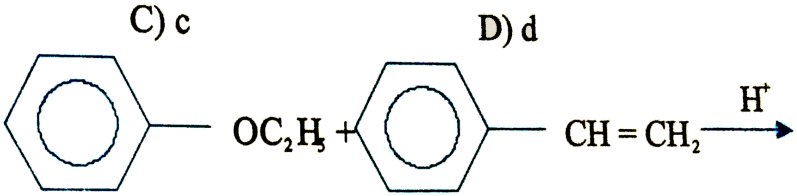
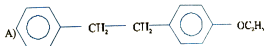
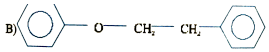
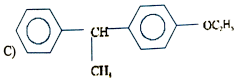
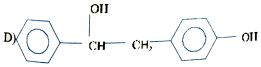
12. Write the product of the following reaction



A. 

B. 

C. 

D. 

Answer: C

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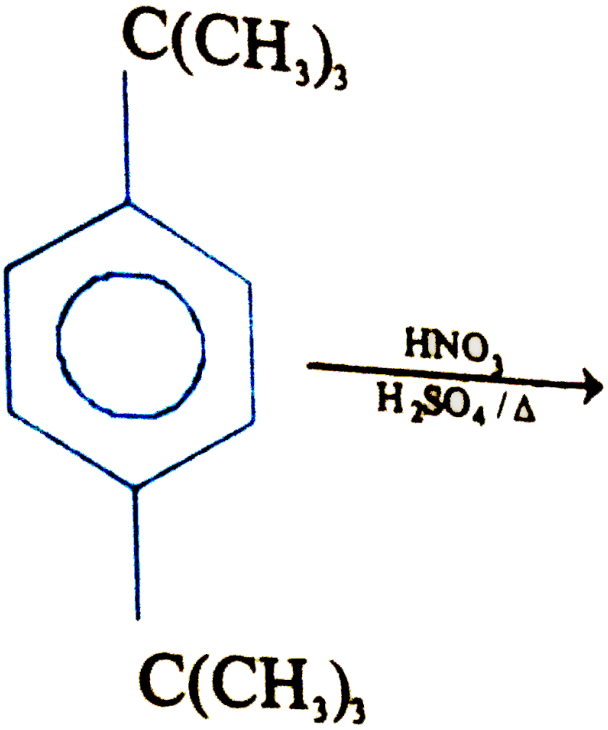
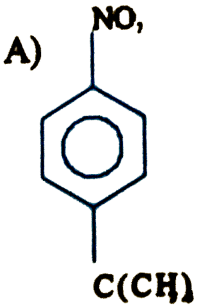
13. Product of the reaction is



A)

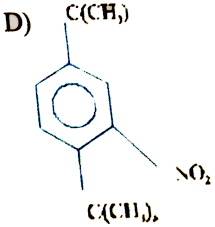


A.

B. $(CH_3)_2C = CH_2$

C) 

C.

D) 

D.

Answer: A

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14. Ozonolysis of mesitylene gives

A. $H_3C - \overset{\overset{O}{||}}{C} - CHO$

B. $H - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - H$

C. $CH_3 - \overset{O}{\overset{||}{C}} - \overset{O}{\overset{||}{C}} - CH_3$

D. C_6H_5COCHO

Answer: A

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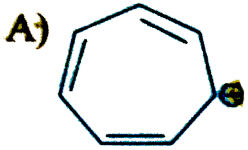
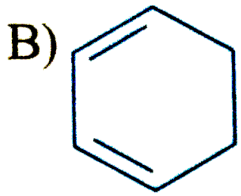
15. Select the compound/ions which is/are anti-aromatic

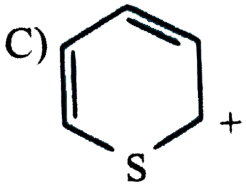
A.

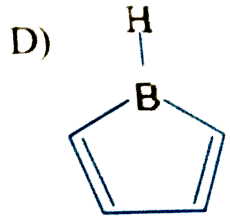


B.



C.



D. 

Answer: A::D

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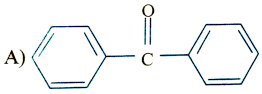
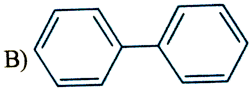
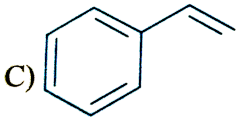
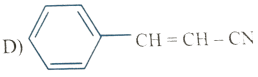
16. Which of the following compound is expected to undergo fastest electrophilic aromatic substitution than unsubstituted benzene

A. 

B. 

C. 

D. 

Answer: B::C

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17. What is/are true regarding nitration and sulphonation of benzene?

A. Nitration of C_6H_6 occur at slightly faster rate than that of C_6D_6

B. Sulphonation of C_6H_6 occur at slightly faster rate than that of C_6D_6

C. Addition of concentrated sulphuric acid catalyze nitration of benzene in presence of concentrated nitric acid

D. Nitration of benzene is easier than sulphonation.

Answer: B::C::D

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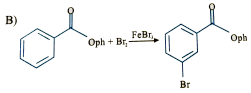
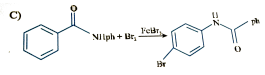
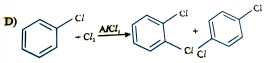
18. In which of the following reactant and product are correctly matched.

A. 

B. 

C. 

D. 

Answer: C::D

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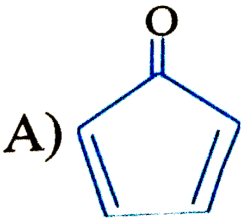
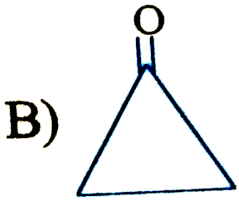
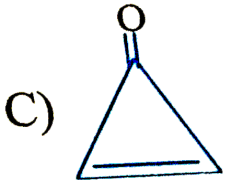
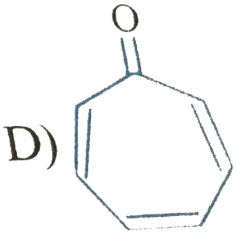
19. Which of the followin compound(s) on treatment with HCl forms a stable salt which can be separated and analyzed using $AgNO_3$.

A. 

B. 

C. 

D. 

Answer: C::D

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20. Which of the following applies corretly to toluene

A. When heated with limited amount of chlorine as Benzyl chloride is formed

B. When trated with Cl_2 in presence of $ZnCl_2$, ortho and para chloro toluene are formed

C. When heated with $AlCl_3$ alone it undergoes disproportionation

D. when treated with conc. HNO_3 in the presence of conc. H_2SO_4. All three isomeric nitrotoluenes are formed with their relatie yield paragtmetagtortho

Answer: A::B

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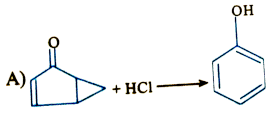
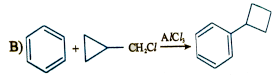
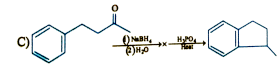
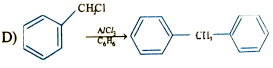
21. Which of the following cases, reactant and product are correctly matched.

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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22. In which of the following pair of compounds the first one is more ractive than second in the same electrophilic aromatic substitution reaction.

A. m-xylene, p-xylene

B. m-dichlorobenzene,chloro benzene

C. Benzene, vinyl benzene

D. Toluene, isopropyl benzene

Answer: A::D

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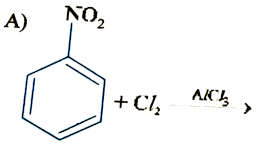
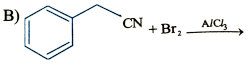
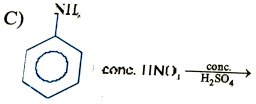
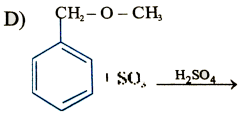
23. In which of the following reation meta substitution product predominate

A. 

B. 

C. 

D. 

Answer: A

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24. Which is/are true about nitration of chlorobenzene using conc. NO_3 / H_2SO_4

A. Nitration is catalyzed by chloro substitution on the ring.

B. Attack of NO_2^+ occur at ortho/para position of benzene ring

C. p-nitro chloro benzene is product in largest amount among three isomeric products

D. presence of Lewis acid catalyze the reaction.

Answer: B::C

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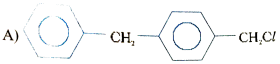
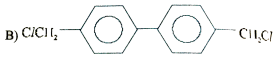
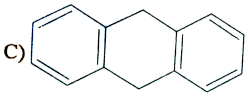
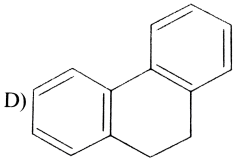
25. Benzene, when treated with CH_2O (methanal) in presence of HCl, undergoes chloromethylation to form benzyl chloride $(C_6H_5CH_2Cl)$. If the produc is further treated with $AlCl_3$ then expected product(s) is/are

A. 

B. 

C. 

D. 

Answer: A::C

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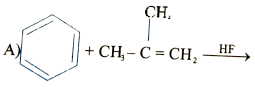
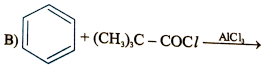
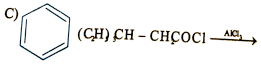
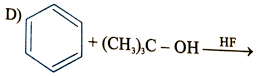
26. In which of the following, one of the product would be t-butyl benzene

A. 

B. 

C. 

D. 

Answer: A::B::D

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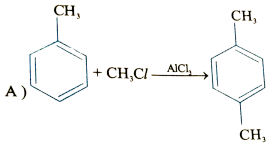
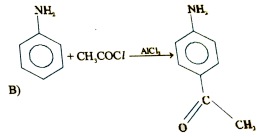
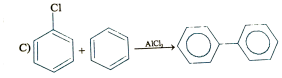
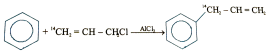
27. Which of the following will fal to product the product shown

A. 

B. 

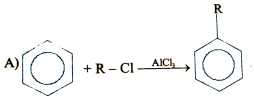
C. 

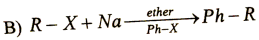
D. 

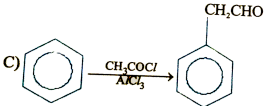
Answer: B::C

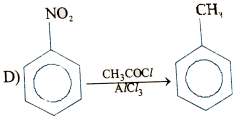
View Text Solution

28. Which of the following is/are correct

A. 

B. 

C. 

D. 

Answer: A::B

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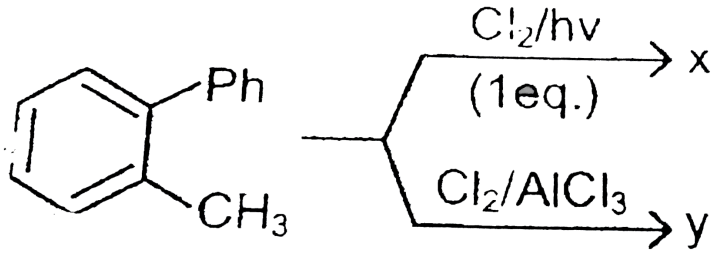
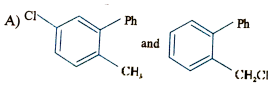
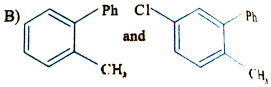
29.

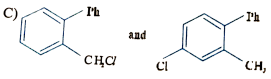


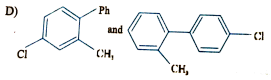
Consider the following reactions to answer the next three questions

Q. Major product X and Y are respectively

A. 

B. 

C. 

D. 

Answer: C

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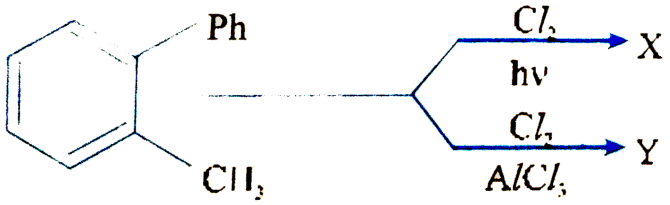
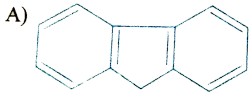
30. Consider the following reaction to answer the next three equestions.

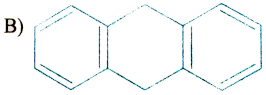


Q. If the product 'X' is treated with $AlCl_3$ it undergoes an interamolecular friedel-craft reaction. The expected product P is

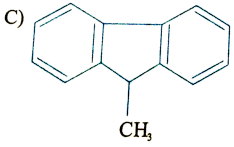
A.

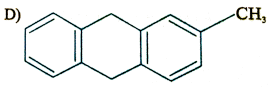


B.



C.



D. 

Answer: A

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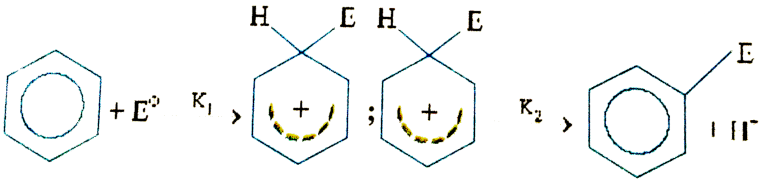
31.



A general mechanism for aromatic electrophilic substitution reaction is. (K_1 and K_2 are rate constant for the forward reaction) also C-D bond in harder to break than a C-H bond, and consequently reaction in which C-D bond broken proceed more slowly than the reaction in which C-H bond are broken. However experimetns reveal that nitration of C_6H_6 and C_6D_6 proceeds at equal rates while the same is not true for sulphonation of C_6H_6 and C_6D_6.

Q. In the nitration reaction

A. $k_1 = k_2$

B. $k_1 > k_2$

C. $k_1 < k_2$

D. $k_1 \underset{\sim}{-} k_2$

Answer: C

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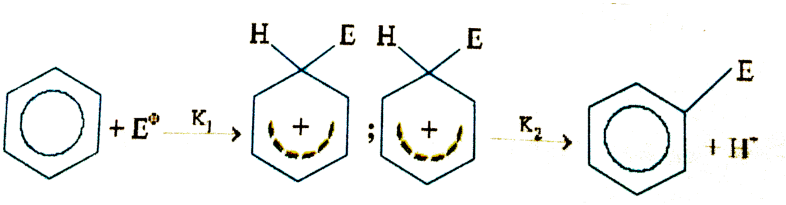
32.



A general mechanism for aromatic electrophilic substitution reaction is. (K_1 and K_2 are rate constant for the forward reaction) also C-D bond in harder to break than a C-H bond, and consequently reaction in which C-D bond broken proceed more slowly than the reaction in which C-H bond are broken. However experimetns reveal that

nitration of C_6H_6 and C_6D_6 proceeds at equal rates while the same is not true for sulphonation of C_6H_6 and C_6D_6.

Q. What can be inferred regarding mechanism of sulphonation of C_6H_6 and C_6D_6

A. Activation energy for the first step in C_6H_6 is greater than that of C_6D_6

B. Activation energy for the first step in C_6H_6 is smaller than that of C_6D_6

C. When benzene is sulphonated, Ea (i) and Ea (ii) are closer than they are when C_6D_6 is sulphonated.

D. When C_6D_6 is sulphonated Ea (i) and Ea (ii) comes very close and K_2 approaches K_1.

Answer: D

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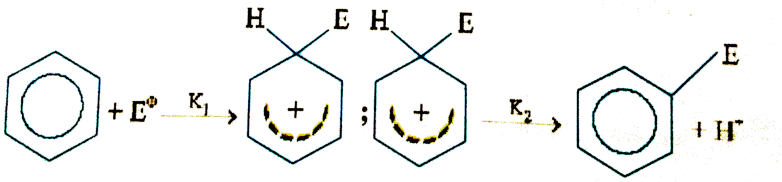
33.



A general mechanism for aromatic electrophilic substitution reaction is. (K_1 and K_2 are rate constant for the forward reaction) also C-D bond in harder to break than a C-H bond, and consequently reaction in which C-D bond broken proceed more slowly than the reaction in which C-H bond are broken. However experimetns reveal that nitration of C_6H_6 and C_6D_6 proceeds at equal rates while the same is not true for sulphonation of C_6H_6 and C_6D_6.

Q. When one of the carbons of benzene is labelled $\left(C^{14}\right)$, in which case we expect greater yield of the product obtained at labelled carbon.

A. Nitration

B. Sulphonation

C. Both have equal chance

D. It depends on temperature.

Answer: C

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34. For any compound to be aromatic, compound should follow a given set of rule known as Huckel's rule

According to Huckel's rule of aromaticy :

(a) compound should be cyclic

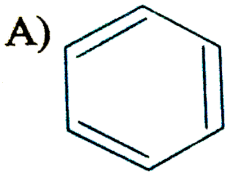
(b) compounds shoulds be planar and conjugated .

(c) compound should have $(4n+2)\pi e^-$

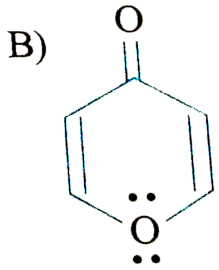
where `n=0, 1, 2, 3.... integer number .

Which of the following is not an aromatic compound ?

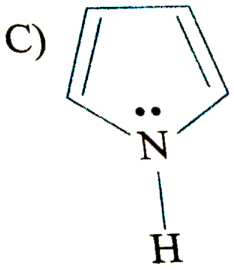
A.



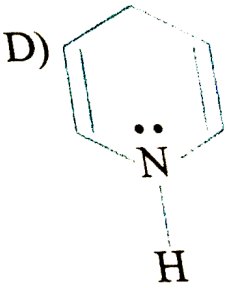
B.



C.



D.



Answer: D

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35. For any compound to be aromatic, compound should follow a given set of rule known as Huckel's rule

According to Huckel's rule of aromaticy :

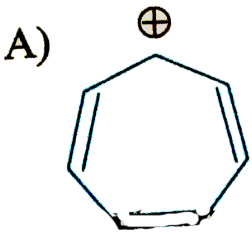
(a) compound should be cyclic

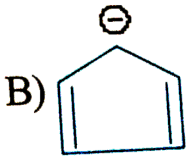
(b) compounds shoulds be planar and conjugated .

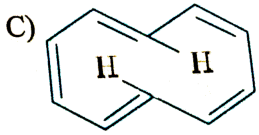
(c) compound should have $(4n + 2)\pi e^-$

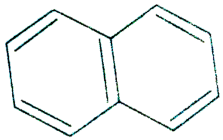
where `n=0, 1, 2, 3.... integer number .

Among the following which is a non-planer compound ?

A. 

B. 

C. 

D) 

D.

Answer: C

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36. For any compound to be aromatic, compound should follow a cartain rule known as Huckel's rule. According to Huckel's rule of aromaticity a). Compound should be cyclic

b). Compound should be planar and conjugated

c). Compound should have $(4n+2)\pi e^{(-)}$

where n=0,1,2,3, ... integer number.

Q. Identiy number of delocalised π-electrons in pyridine

A. 8

B. 6

C. 4

D. 10

Answer: B

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37. For any compound to be aromatic, compound should follow a cartain rule known as Huckel's rule. According to Huckel's rule of aromaticity a). Compound should be cyclic

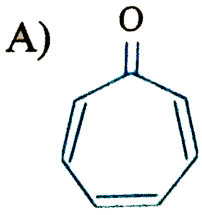
b). Compound should be planar and conjugated

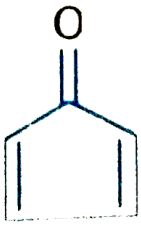
c). Compound should have $(4n+2)\pi e^{(-)}$

where n=0,1,2,3, ... integer number.

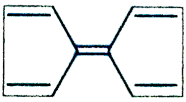
Q. Identify the compound while have maximum dipole moment.

A.



B) 

B.

C) 

C.

D) 

D.

Answer: A

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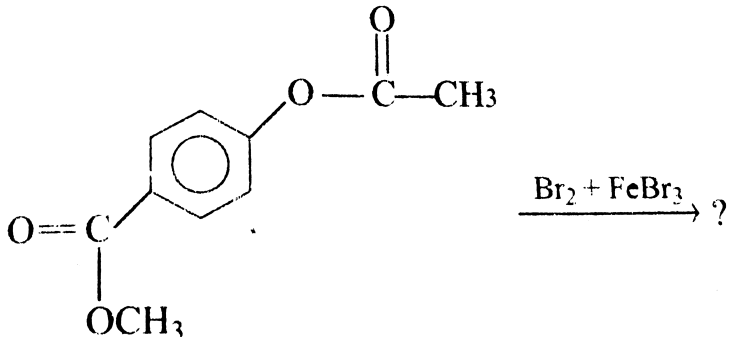
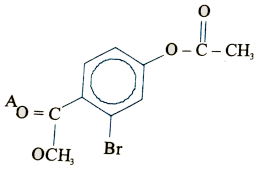
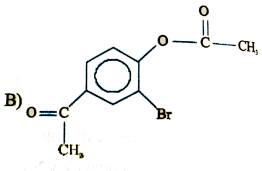
38. If aromatic ring is substitued by more than groups then electrophilic aromatic substitution reaction take place according to more activating group. Type of group which donate electron in

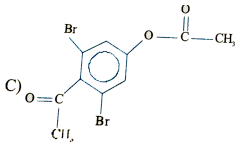
aromatic ring known as activating group



Find out correct product of reaction .

A. 

B. 

C. 

D. No product is formed

Answer: A

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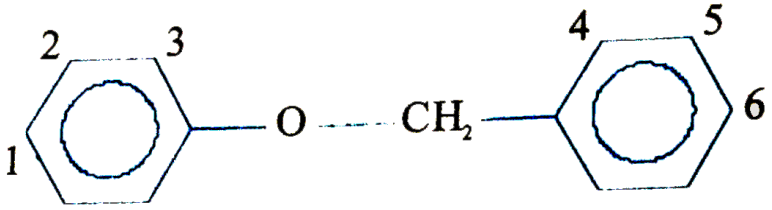
39. If aromatic ring is substituted by more than one group then electrophilic aromatic substitution reaction take place according to more activating group. The group which donates electrons to aromatic ring knwn as activating group and which withdraw electrons from the ring is called electron withdrawing group. generally all lectron releasing groups activates benzene ring towards electrophilic substitution and electron withdrawing groups deactivates ring towards electrophilic substitutions.

Q. Major product formation takes place at which position when the following is subjected for $E^{\oplus}$ substitution



A. 3

B. 1

C. 6

D. 4

Answer: B

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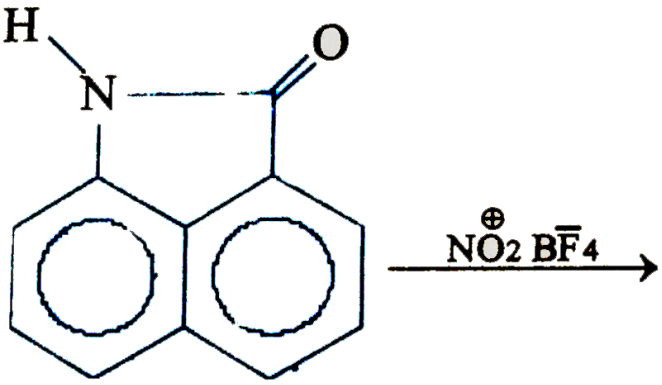
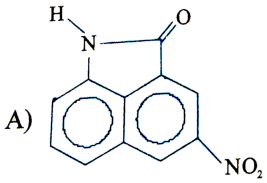
40. If aromatic ring is substituted by more than one group then electrophilic aromatic substitution reaction take place according to more activating group. The group which donates electrons to aromatic ring knwn as activating group and which withdraw electrons from the ring is called electron withdrawing group. generally all lectron releasing groups activates benzene ring towards electrophilic substitution and electron withdrawing groups deactivates ring towards electrophilic substitutions.

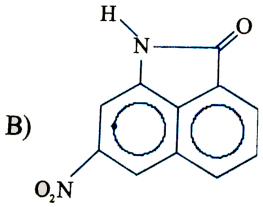
Q. Find out major product of following reaction



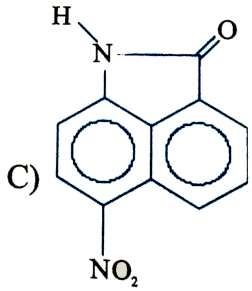
A.

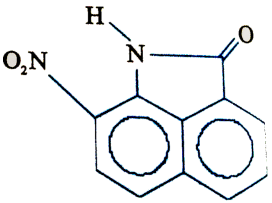


B.



C.





D.

Answer: C

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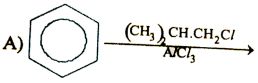
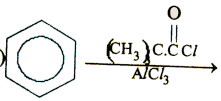
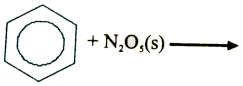
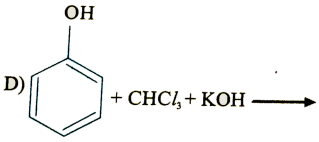
41. Column matching prolems each column may have more than one answer.

COLUMN - I

A) 

B) 

C) 

D) 

COLUMN - II

p) Electrophilic aromatic substitution

q) Reimer- Tiemann reaction

r) Aromatic carbonyl compound

s) Alkyl benzene

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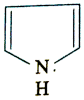
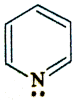
42. Match the following columns

COLUMN - I	COLUMN - II
A) 	p) Aromatic
B) 	q) Non Aromatic
C) 	r) tub shape structure
D) 	s) Undergoes electrophilic aromatic substitution reaction

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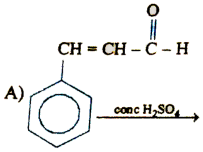
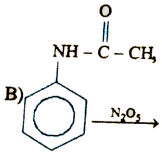
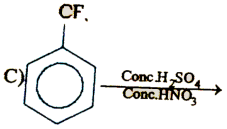
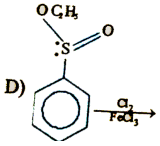
43.

COLUMN - I	COLUMN - II
A) 	p) Ortho and para substitution
B) 	q) meta substitution
C) 	r) Substitution is faster than benzene
D) 	s) Substitution is slower than Benzene

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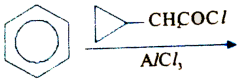
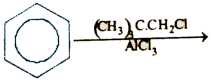
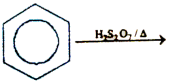
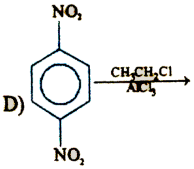
44.

COLUMN - I	COLUMN - II
A) 	p) No reaction
B) 	q) Attacking Electrophile is carbocation
C) 	r) Abnormal product
D) 	s) Primary kinetic isotopic effect

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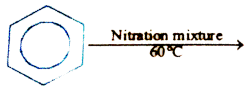
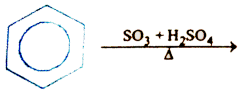
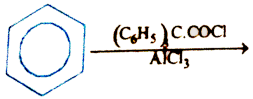
45.

COLUMN -I	COLUMN -II
A) 	p) Primary kinetic Isotope effect
B) 	q) Reversible reaction
C) 	r) Abnormal product
D) 	s) Arenium Ion intermediate
	t) Decarbonylation

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46. Identify numbr of substitutents those are deactivating but ortho and para directing.

$$-\ddot{F}\rangle,\ -CH_3,\ -\overset{O}{\overset{||}{C}}-NH_2,\ -CH=CH-\overset{O}{\overset{||}{C}}-OH,\ -\overset{O}{\overset{||}{\underset{\cdot\cdot}{S}}}-C_2H_5$$

$$-\overset{O}{\overset{||}{\underset{||}{S}}}-C_2H_5,\ -\ddot{N}=O,\ -\overset{O}{\overset{||}{C}}-NH_3,\ -CH=CH-\overset{O}{\overset{||}{C}}-H$$

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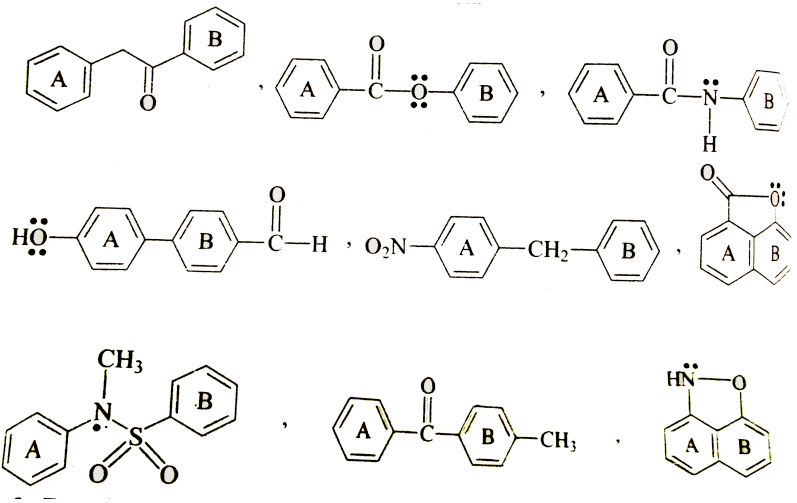
47. Each of the compounds shows below has two aromatic ring. Labled as A and Identify number of compounds in which ring B is more active than ring A for electrophilic aromatic substitution reaction .



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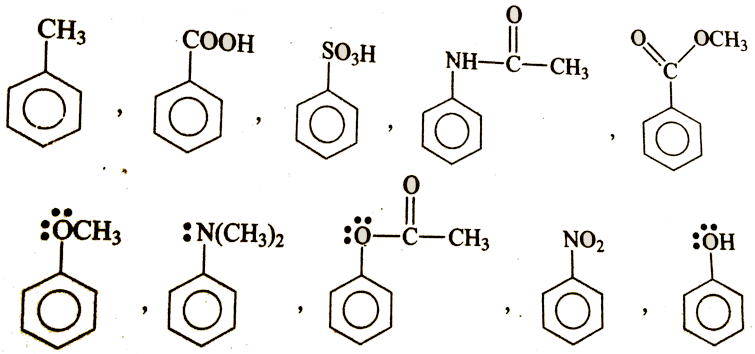
48. Examine the structural formula shown below and find out how many compounds undergo electrophilic nitration more rapidly than

flouro benzene.



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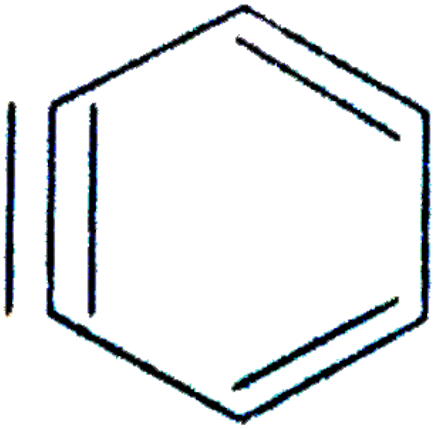
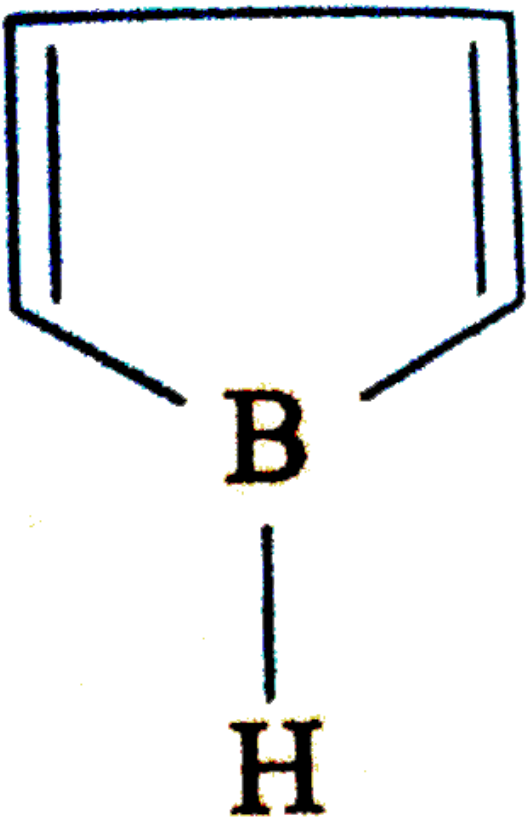
49. How many of the following are aromatic in nature.

A)



D)



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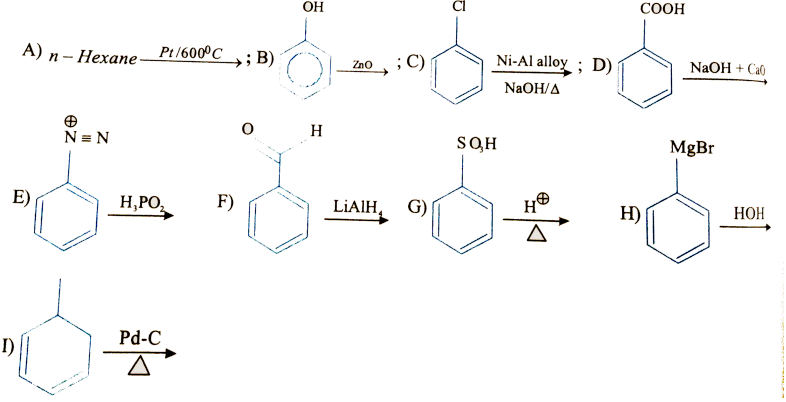
50. Identify number of reactions that can give benzene as major product.



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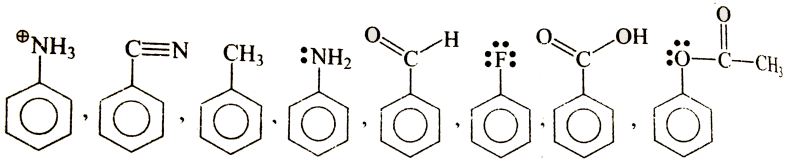
51. Examine the structural formula shown below and find out how many compounds can not give Friedel Carfts reaction .



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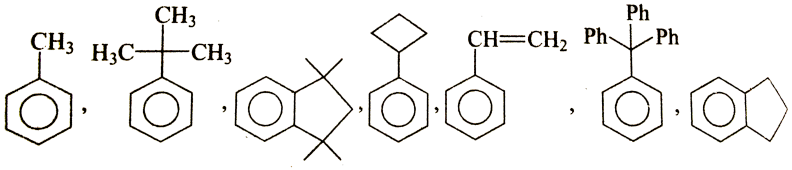
52. Eaxmine the structural formula shown below and find out how many compounds will show oxidation reaction with acidic $KMnO_4$



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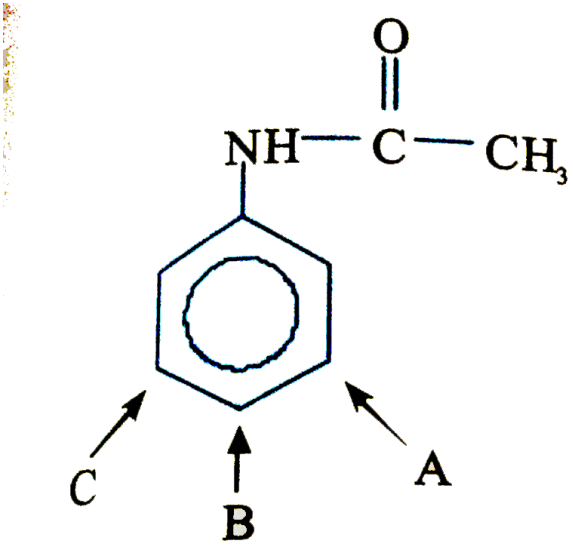
Level-6



1.

Identify the position where electrophilic aromatic substitution EAS) is most favourable

A. A

B. B

C. C

D. D

Answer: B

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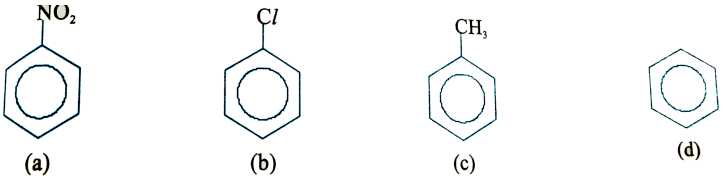
2. 

Correct order of rate of EAS (electrophilic aromatic substitution) is

A. cgtbgtagtd

B. cgtdgtagtb

C. agtbgtcgtd

D. cgtdgtbgta

Answer: D

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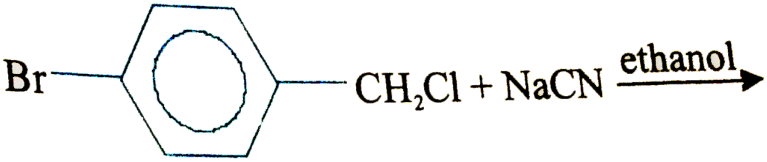
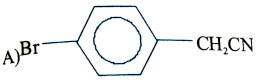
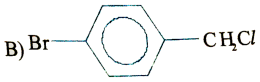
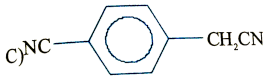
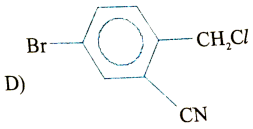
3. The product obtained from the reaction



A. 

B. 

C. 

D. 

Answer: A

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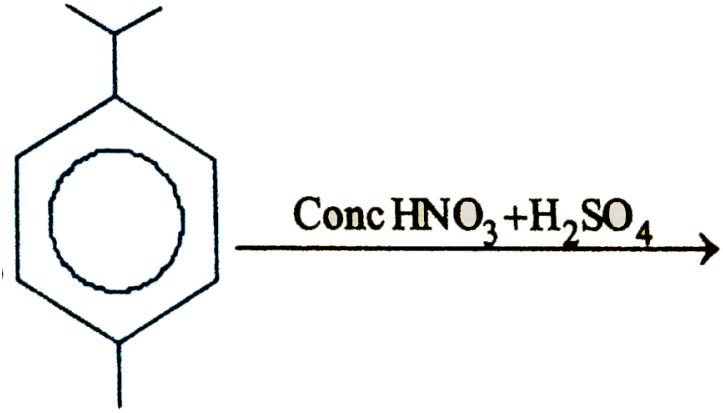
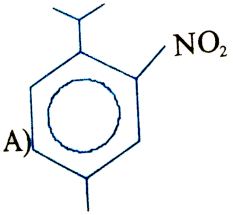
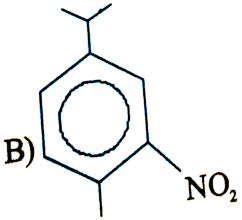
4. The major product formed in the reaction is



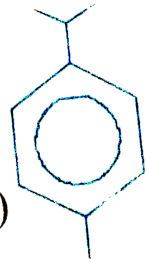


A.



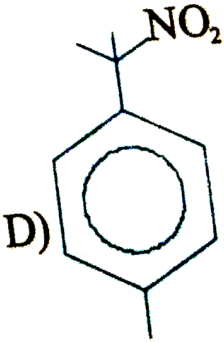
B.

C)



C.

D)



D.

Answer: B

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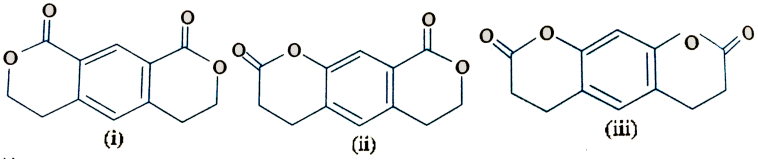
5. Increasing order of rate of reaction with Conc. HNO_3 / H_2SO_4 is



A. iiiltiilti

B. iiltiiilti

C. iltiiiltii

D. iltiiltiii

Answer: D

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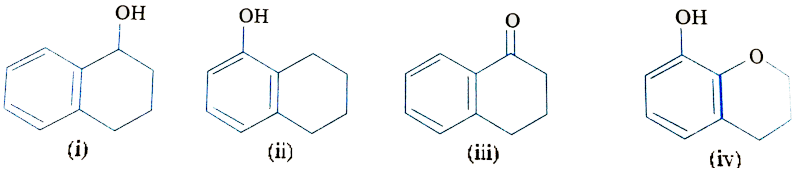
6. Increasing order of rate of reaction with $Br_2 / AlCl_3$ is



A. iiiltiltiiltiv

B. ivltiiltiltiii

C. iiltivltiiilti

D. ivltiiltiiilti

Answer: A

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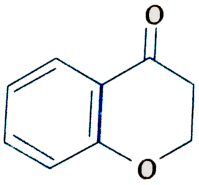
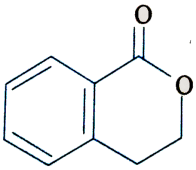
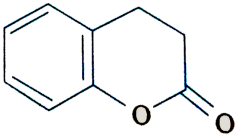
7. Rank in order of increasing rate of reaction towards EAS with bromine in the presence of $FeBr_3$

A) 

B) 

C) 

A. BltAltC

B. BltCltA

C. AltBltC

D. AltCltB

Answer: A

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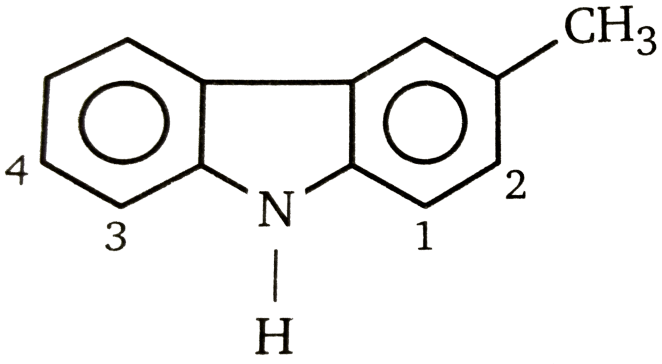
8.



Identify the position where E.A.S. can take place.

A. 1

B. 2

C. 3

D. 4

Answer: A

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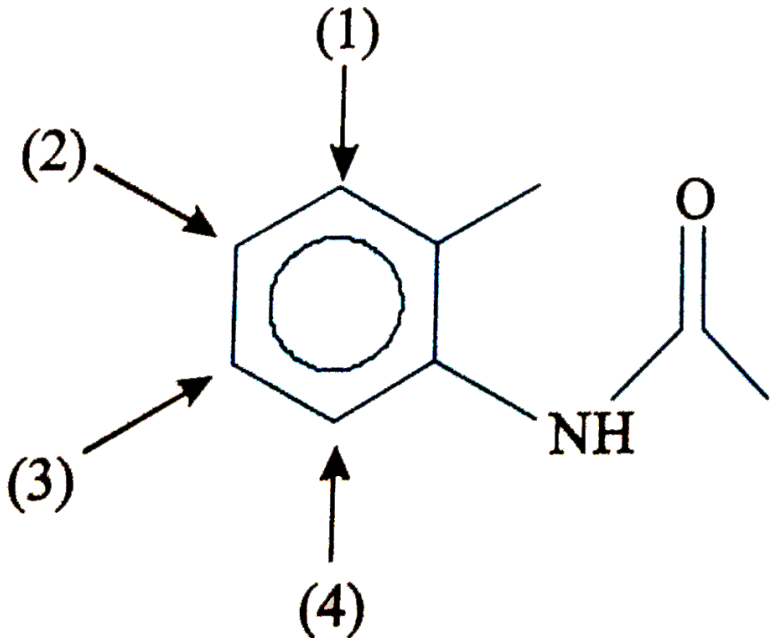
9.



In this, sulhonation is most favorable at the carbon number.

A. 1

B. 2

C. 3

D. 4

Answer: B

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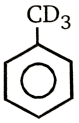
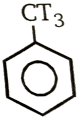
10. Arrange the following in decreasing order of reactivity towards EAS (electrophilic aromatic substitution)

(a) 

(a)



(b)



(c)

A. AgtBgtC

B. CgtBgtA

C. AgtCgtB

D. CgtAgtB

Answer: A

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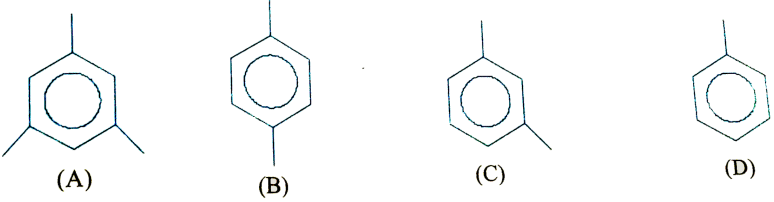
11. Arrange the decreasing order of rate of electrophilic aromatic substitution



A. AgtBgtCgtD

B. AgtCgtBgtD

C. BgtAgtCgtD

D. BgtCgtAgtD

Answer: B

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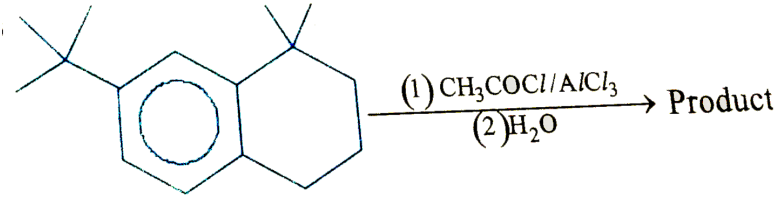
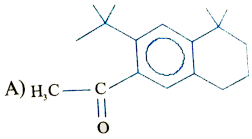
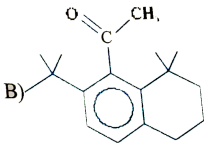
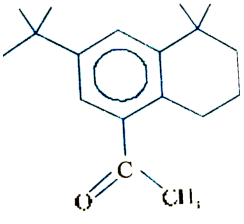
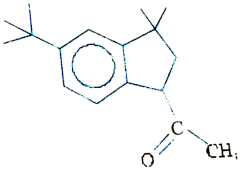
12. The major product of the reaction is



A. 

B. 

C. 

D. 

Answer: C

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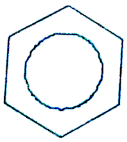
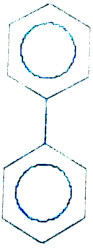
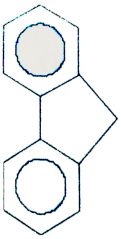
(I)  (II)  (III) 

13.

Arrangement in their deacreasing order of rate of electrophilic aromatic substitution

A. Igt IIgt IIIl

B. IIIgt IIgt I

C. IIIgt Igt II

D. Igt IIIgt II

Answer: B

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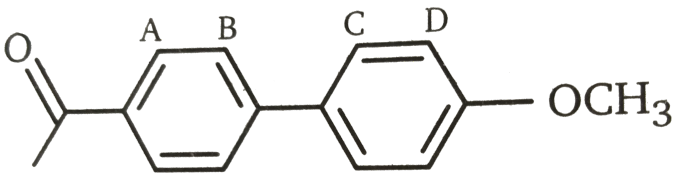
14. Which position will be attacked most rapidly by the nitronium ion $(-NO_2)^+$ when the compound undergoes nitration with HNO_3/H_2SO_4:



A. A

B. B

C. C

D. D

Answer: D

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15. What is the correct order of o/p ration when E^+ attackes the following system ?

(A) PhF

(B) $PhCl$

(C) $PhBr$

(D) PhI

A. AltBltCltD

B. A=B=C=D

C. DltCltBltA

D. DltBltAltC

Answer: C

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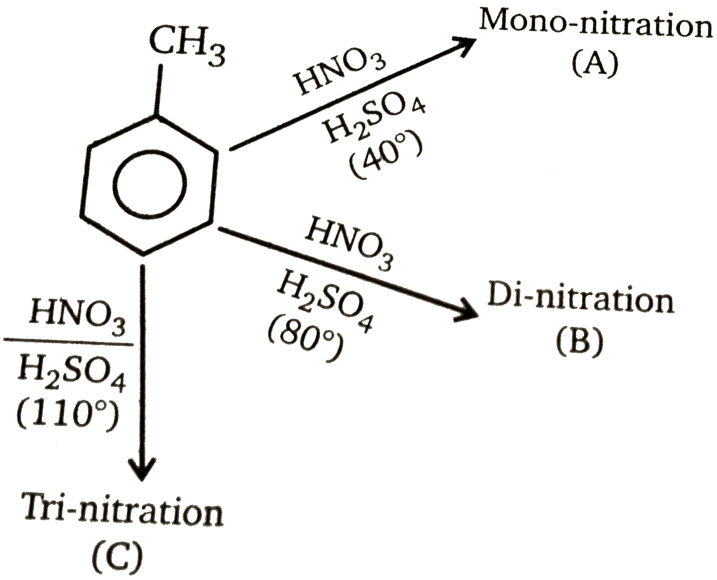
16. How many products are capables of beings formed from toluene in each of following reaction ?



A. A=3,B=6,C=8

B. A=3,B=6,C=6

C. A=3,B=6,C=10

D. A=3,B=4,C=6

Answer: B

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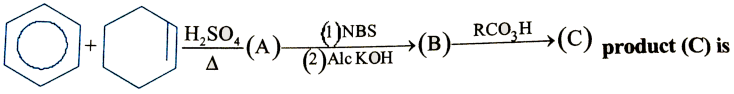
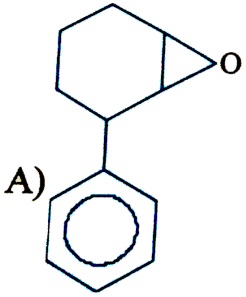
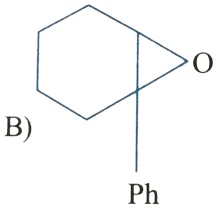
17.  product (C) is

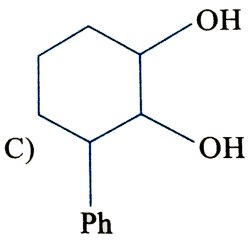
product (C) is



A.

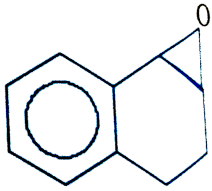


B.



C.

D)



D.

Answer: B

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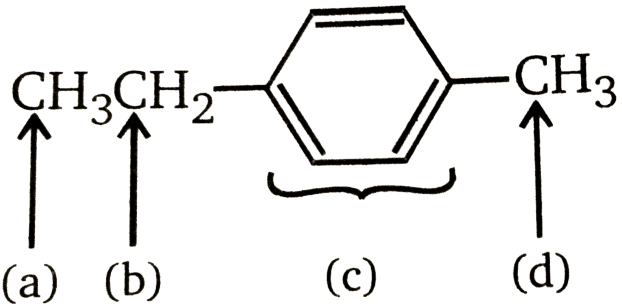
18. Which of the following hydrogens is most easily abstracted on reaction with bromine free radicals, $Br^{\cdot}$?



A. A

B. B

C. C

D. D

Answer: B

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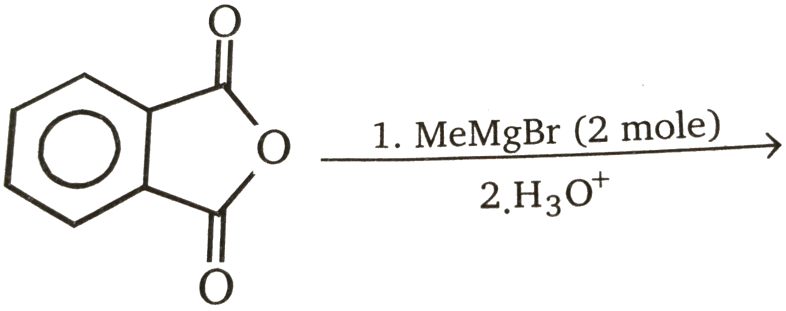
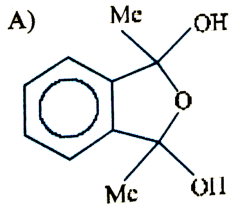
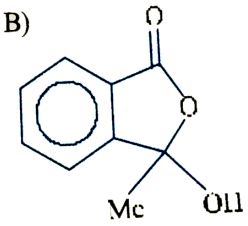
19. For the reaction, the product expected is :



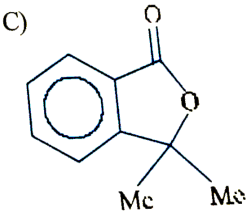
A.



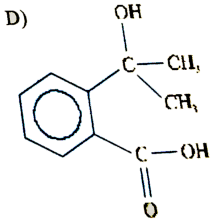
B.



C.



D.



Answer: D

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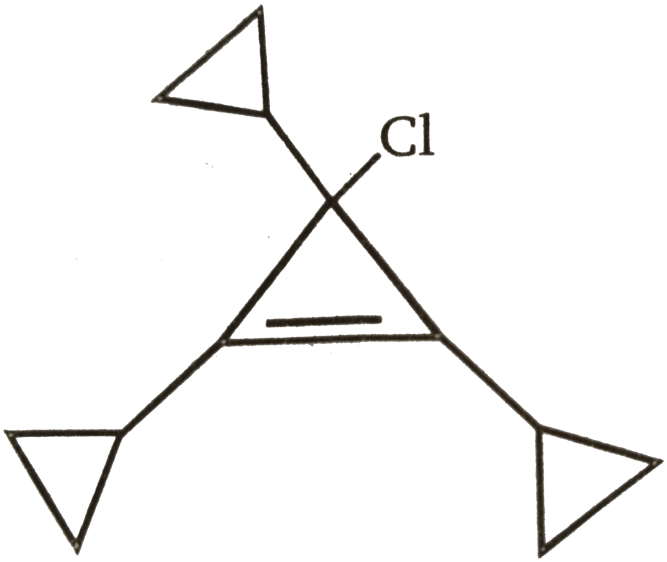

20.

In the above compound Cl will liberated easily in the form of:

A. $Cl^{\oplus}$

B. Cl^{-}

C. Cl^{*}

D. Cl^{2+}

Answer: B

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21. In the sulhonation, acetylation and formylation of benzene the group of effective electrophiles would be

A. $SO_3^+, CH_3\overset{\oplus}{C}H_2, HC^+ = O$

B. $SO_3, CH_3 - C \equiv O^+, H\overset{+}{C}O$

C. $SO_3^+, CH_3CHO, CO + HCl$

D. HSO_3, CH_3CO, HCO

Answer: B

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22. $C_6H_6 + A \xrightarrow{AlCl_3} C_6H_5CONH_2$. A in the above reaction is

A. NH_2CONH_2

B. $ClCONH_2$

C. CH_3CONH_2

D. $CH_2(Cl)CONH_2$

Answer: B

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23. $C_6H_6 \xrightarrow[AlCl_3]{CH_3COCl} A \xrightarrow[HCl]{Zn-Hg} B$. The end product in the above sequence is

A. Toluene

B. Ethyl benzene

C. Both and above

D. none

Answer: B

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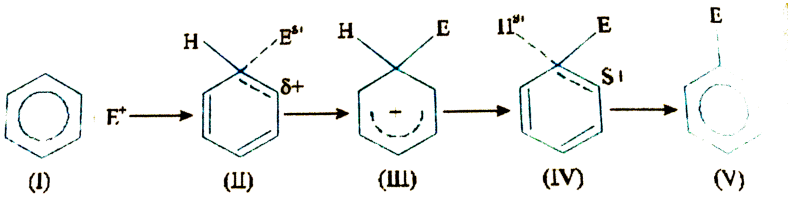
24. Which of the following species is expected have maximum ethalpy in an electrophilic aromatic substitution reaction.



A. Species (II)

B. Species (III)

C. Species (IV)

D. Species (V)

Answer: A

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25. For the electrophilic substitution reaction involving nitration, which of the following sequence regarding the rate of the reaction is true?

A. $KC_6H_6 > KC_6D_6 > KC_6T_6$

B. $KC_6H_6 < KC_6D_6 < KC_6T_6$

C. $KC_6H_6 = KC_6D_6 = KC_6T_6$

D. $KC_6H_6 > KC_6D_6 < KC_6T_6$

Answer: C

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26. For the electrophilic substitution reaction sulphonation which of the following sequence regarding the rate of the reaction is true

A. $KC_6H_6 > KC_6D_6 > KC_6T_6$

B. $KC_6H_6 < KCK_6D_6 < KC_6T_6$

C. $KC_6H_6 = KC_6D_6 = KC_6T_6$

D. $KC_6H_6 > KC_6D_6 < KC_6T_6$

Answer: A

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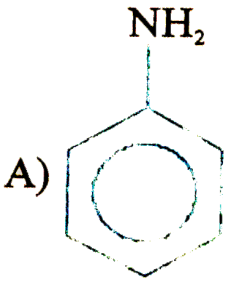
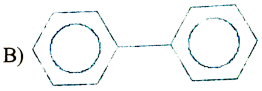
27. Which of the following will undergo nitration slower than benzene ?

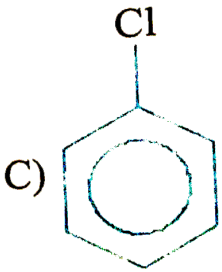
A.

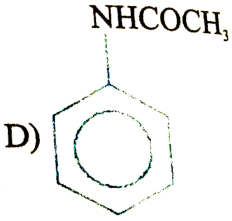


B.



C.





D.

Answer: C

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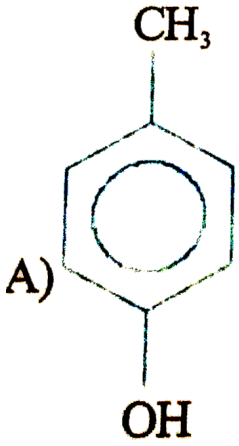
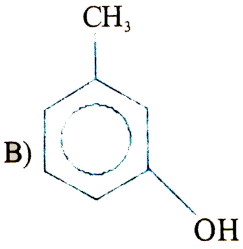
28. The compound that does not give a tribromo derivative on treatment with bromine water is

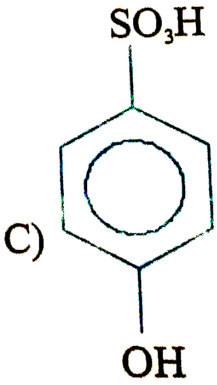


A.

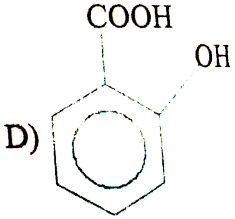
B.



C.



D.



Answer: A

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29. Amongst the following, moderately activating groups is

A. $-NHR$

B. $\_\ NHCOCH_3$

C. $-NR_2$

D. $-CH_3$

Answer: B

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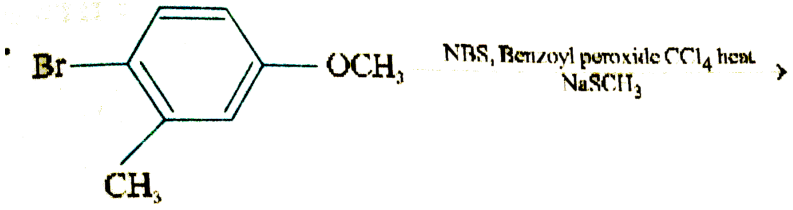
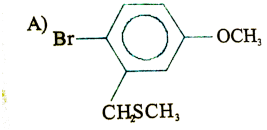
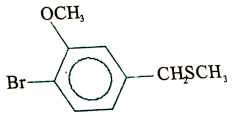
30.



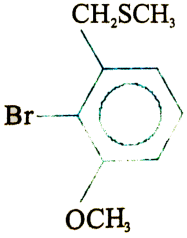
A.



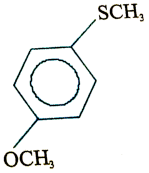
B. B)



C. C)



D. D)



Answer: A

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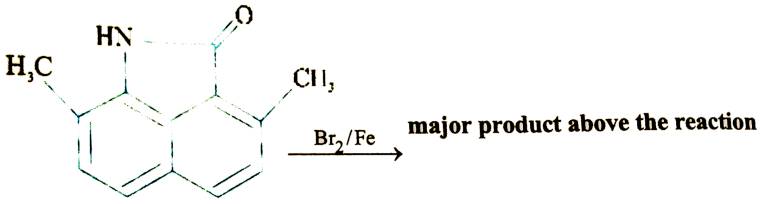
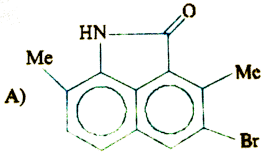
31.

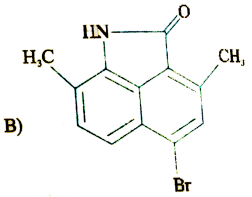


Major product above the reaction.

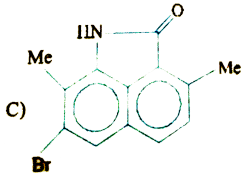
A.



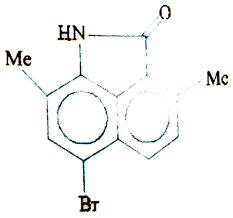
B.



C.



D.



Answer: D

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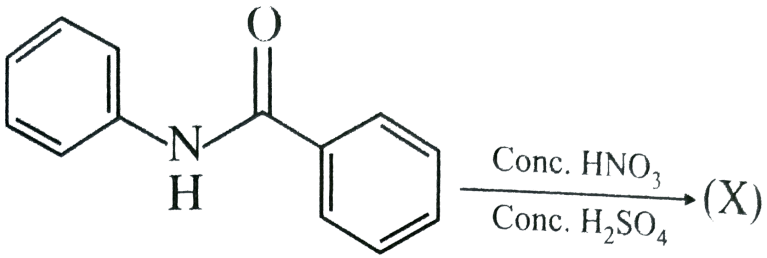
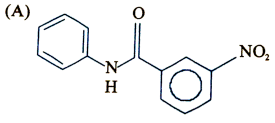
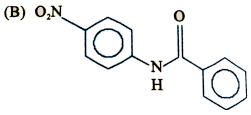
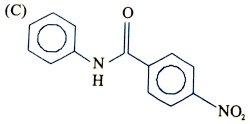


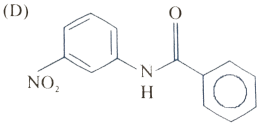
32.

In the following reaction, the structure of the major product (X) is:

A. 

B. 

C. 

D. 

Answer: B

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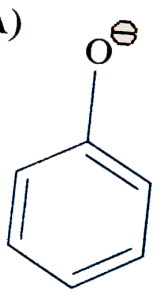
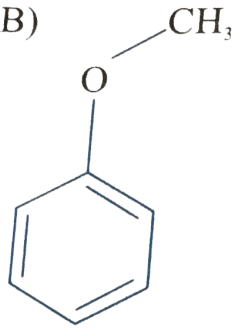
33. Which of the following is the most reactive towards eklectrophilic aromatic substitution?

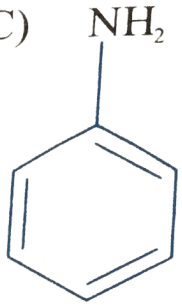
A. (A)

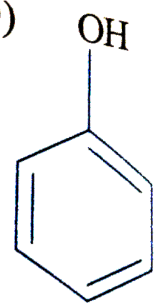


B. (B)



C. (C)



(D) 

D.

Answer: A

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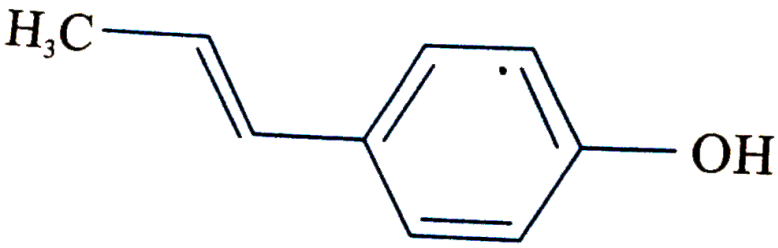
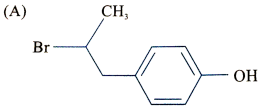
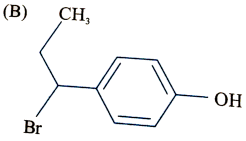
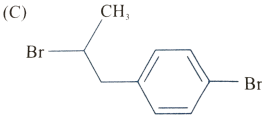
34. The reaction of 

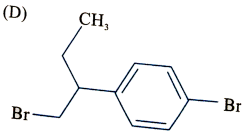
With HBr gives:

(A) 

A.

B. 

C. 

D. 

Answer: B

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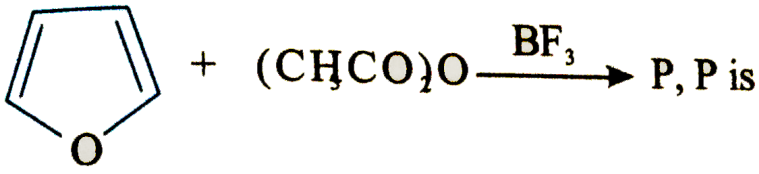
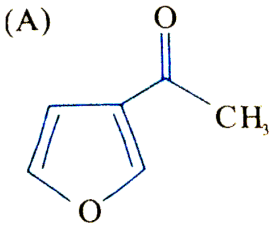
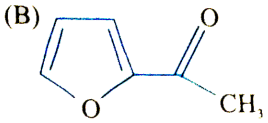
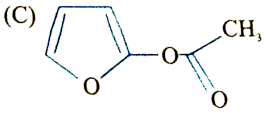
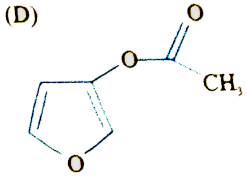
35. 

A. 

B. 

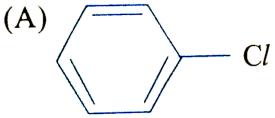
C. 

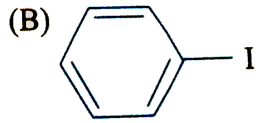
D. 

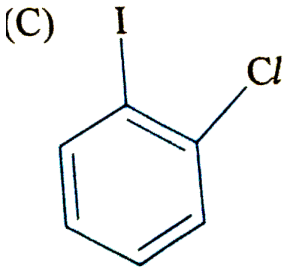
Answer: B

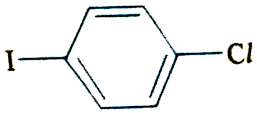
View Text Solution

36. Benzene on reaction with ICI in presence of anhydrous $AlCl_3$ gives?

A. 

B. 

C. 

D. 

Answer: B

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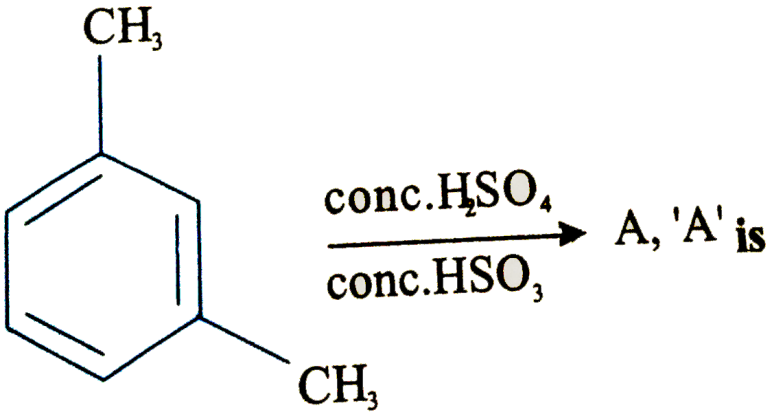
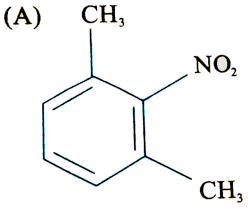
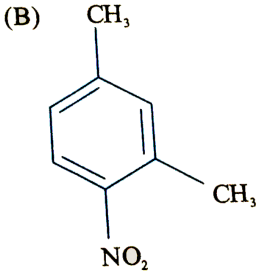
37. Complete the following reaction

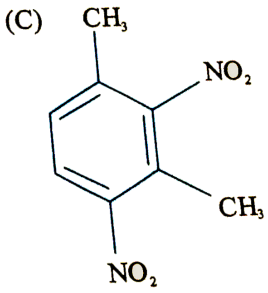


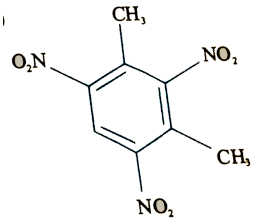
A.



B.



C. (C) 

D. 

Answer: B

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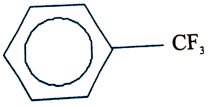
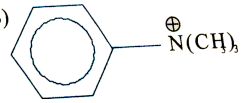
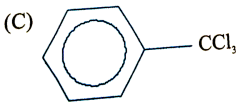
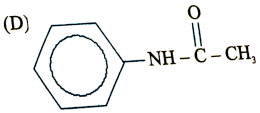
38. In which case, EAS will not be in meta position?

A. (A) 

B. (B) 

C. 

D. 

Answer: D

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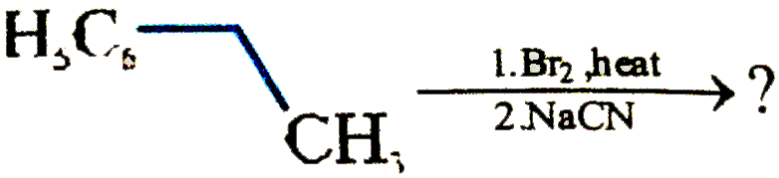
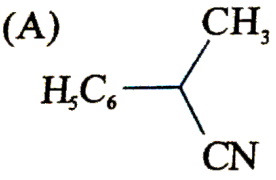
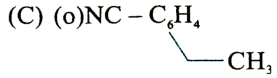
39. Write the major product of the following reaction



A. 

B. 

C. 

D. 

Answer: A

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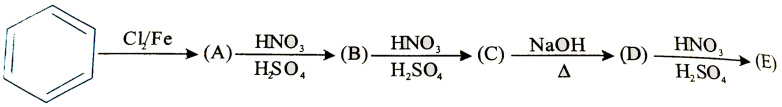
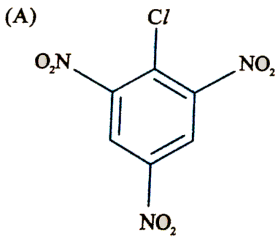
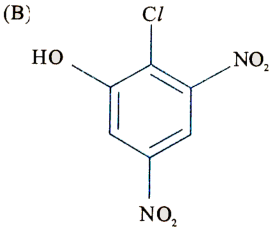
40. 

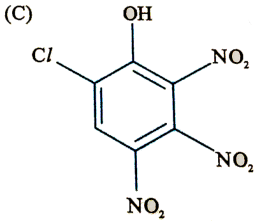
The compound (E) is:

A. 

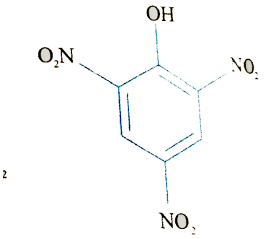
B.



C.



D.



Answer: D

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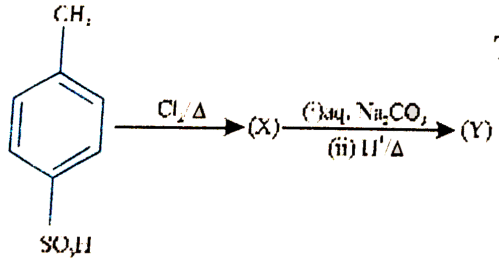
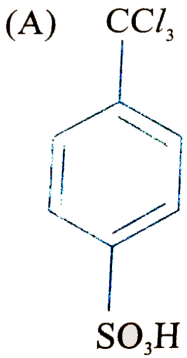


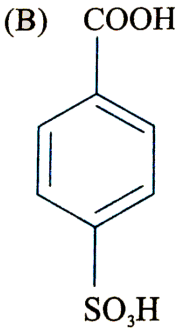
The product 'Y' is:

41.

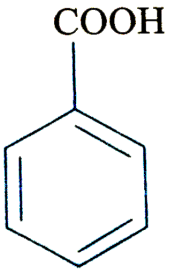
The product 'Y' is:



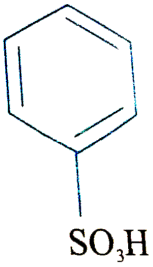
A.



B.

(C) 

C.

(D) 

D.

Answer: C

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42. Correct statement regarding the electrophilic substitution of C_6H_6

A. It involves two transition state

B. It involves one intermediate which is non aromatic.

C. It involves one intermediate which is non aromatic

D. It is an endothermic overall

Answer: A::B::C

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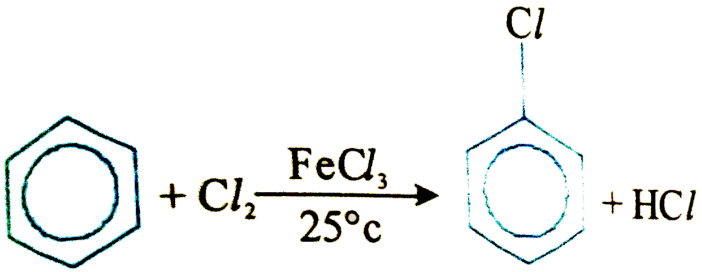
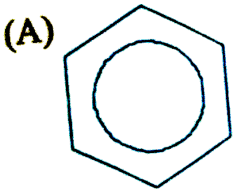
43.



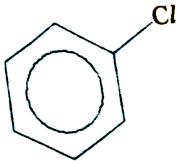
The rate of the reaction depends on the concentration of

A.



B. Cl_2

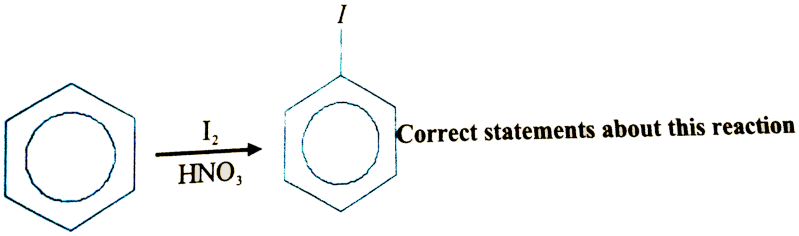
C. $FeCl_3$

(D) 

D.

Answer: A::B::C

View Text Solution

44. 

Correct statements about this reaction

A. The correct order of rate of reaction $C_6H_6 > C_6D_6 > C_6T_6$

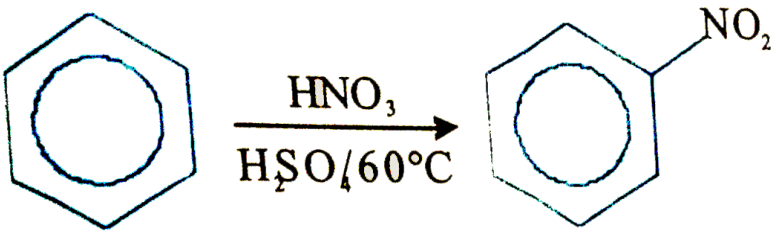
B. HNO_3 functions as an oxidising agent

C. In the absence of HNO_3 it is reversible

D. The electrophil in the above reactions is $I^{\oplus}$

Answer: A::B::C::D

View Text Solution



45.

In the above reaction

A. HNO_3 functions as a base

B. H_2SO_4 functions as dehydrating agent

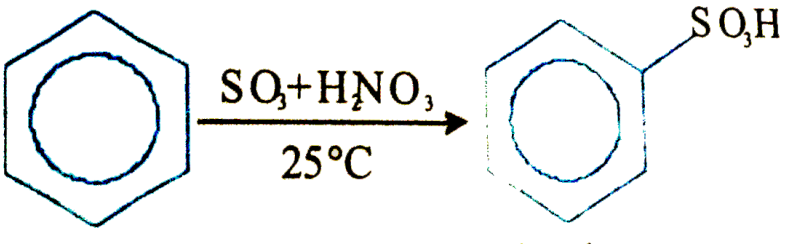
C. vant hoff factor for the above reactions is roughly 4.

D. Hybridization of central atom in the attacking electrophile is Sp

Answer: A::B::C::D

View Text Solution

46.



Correct statement about this reaction is/are

A. The reaction is completely reversible

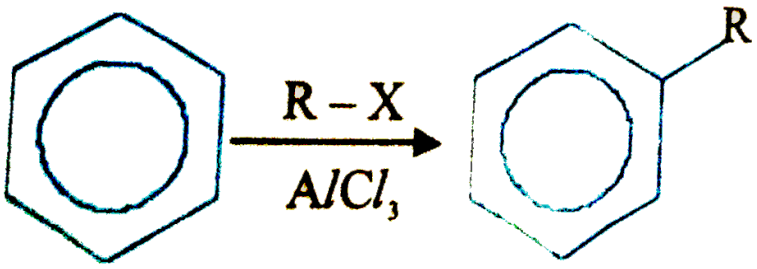
B. It shows primary kinetic isotopic effect

C. The electrophil involved in the reaction is SO_3

D. The electrophile involved in the reactio is $SO_3H^{\oplus}$

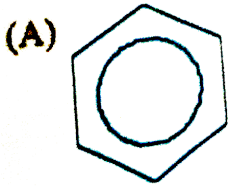
Answer: A::B::C

View Text Solution



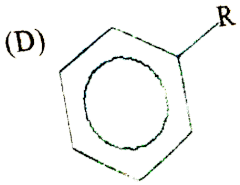
47.

Generally rate of the reaction depends on the concentration of

A. 

B. $R - X$

C. $AlCl_3$

D. 

Answer: A::B

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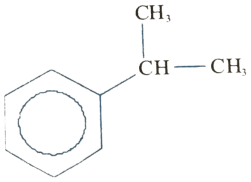
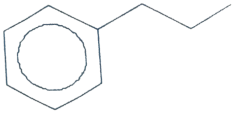
48.  $\xrightarrow[HF\,/\,0°\,C]{CH_3CH=CH_2}$ **Major product. In this reaction**

Major product. In this reaction.

A. The attacking electrophile is $CH_3\overset{\oplus}{C}HCH_3$

B. 

C. HF is a catalyst

D. The major product of the reaction is 

Answer: A::B::C

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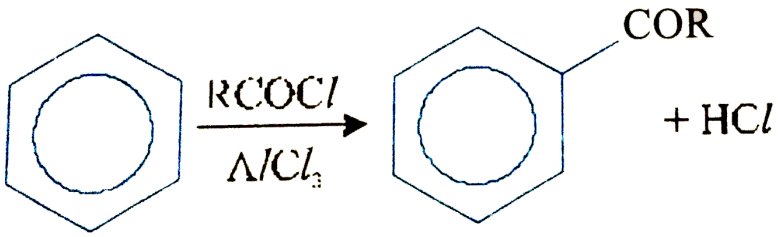
49. 

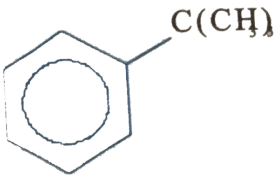
The correct statement(s) regarding the above reaction is/are

A. more than catalytic amounts of $AlCl_3$ is required for the reaction

B. Commonly observed rate $= k[Ar - H][RCOCl][AlCl_3]$

C. The electrophile in the reaction $R - \overset{\oplus}{C} = 0$

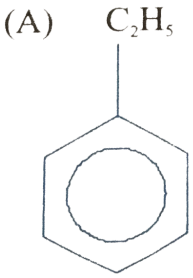
D. If in RCOCl 'R' is $(CH_3)_3C -$ the product of the reaction is

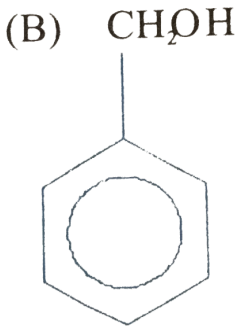


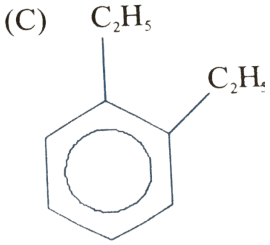
Answer: A::B::C::D

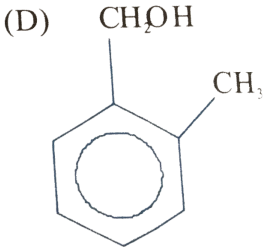
View Text Solution

50. Benzoic acid can be prepared by the oxidation of

A. (A) 

B. (B) 

C. (C) 

D. (D) 

Answer: A::B

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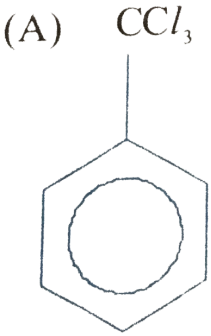
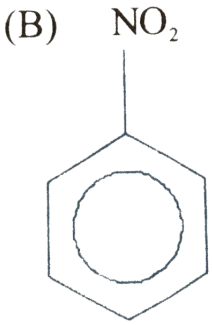
51. In which cases $NO_2^{\oplus}$ will attack meta position

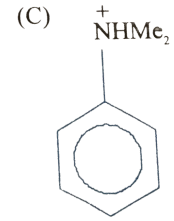
A.



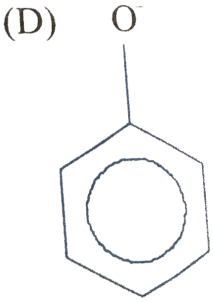
B.



C.



D.



Answer: A::B::C

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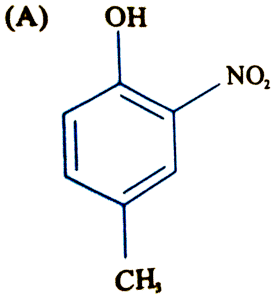
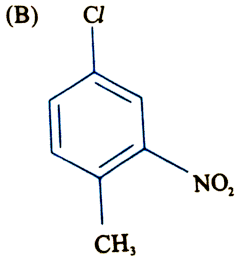
52. p-Chlorotoluene on nitration given

A.



B.



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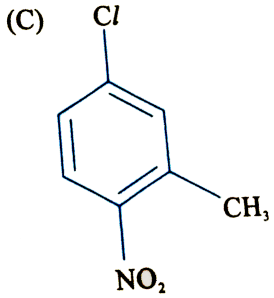
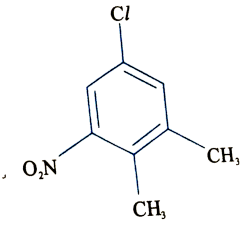


D.



Answer: B

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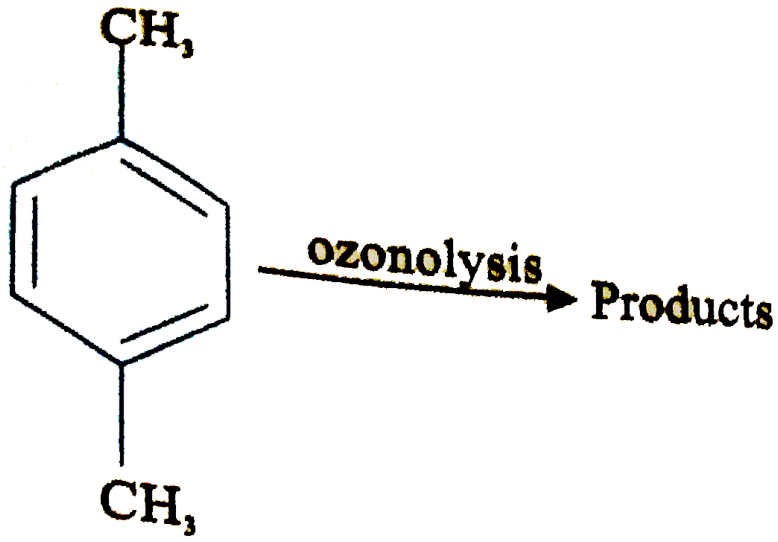


53. The products formed are:

A. $CH_3 - \overset{\overset{O}{||}}{C} - CHO$

B. $CHO - CHO$

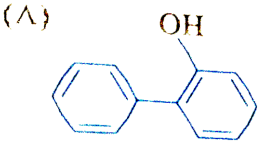
C. $CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$

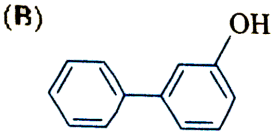
D. $HCOOH$

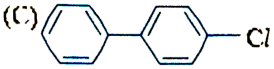
Answer: A::B

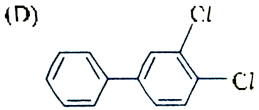
Watch Video Solution

54. The reaction of biphenyl with HOCl in the presence of a strong acid gives

A. 

B. 

C. 

D. 

Answer: C

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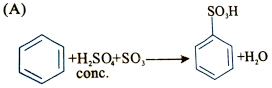
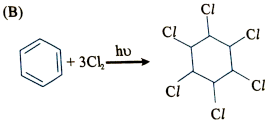
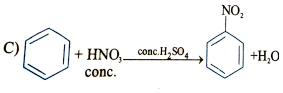
55. Which of the following is an electrophilic substitution reaction?

A. 

B. 

C. 

D.

Answer: A::C

View Text Solution

56. m-Nitrobenzoic acid can be obtained by

A. toluene $\xrightarrow[KMnO_4]{[O]} A \xrightarrow[H_2SO_4]{HNO_3}$

B. toluene $\xrightarrow[CrO_2Cl_2]{[O]} A \xrightarrow[H_2SO_4]{HNO_3} B \xrightarrow[KMnO_4]{[O]}$

C. toluene $\xrightarrow[HNO_3+H_2SO_4]{\text{Nitration}} A \xrightarrow[KMnO_4]{[O]}$

D. all these method

Answer: A::B

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57. Iodobenzene can be obtained by-

A. $C_6H_6 + I_2 \rightarrow$

B. $C_6H_6 + I_2 \xrightarrow{HNO_3}$

C. $C_6H_5N_2^+Cl^- + K < o$

D. $C_6H_6 + Hi \rightarrow$

Answer: B::C

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58. Ethyl benzene can be prepared from

A. acetophenone with $Zn(Hg)$ and conc. HCl

B. acetophenone with NH_2NH_2, KOH and ethylene glycol.

C. benzene reacts with C_2H_5Cl in presence of $AlCl_3$

D. toluene reacts with CH_3Cl in presence of $AlCl_3$

Answer: A::B::C

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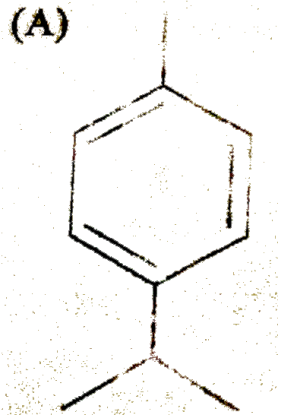
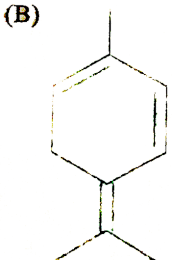
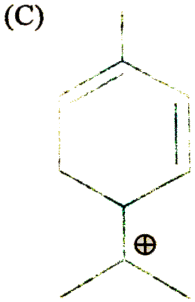
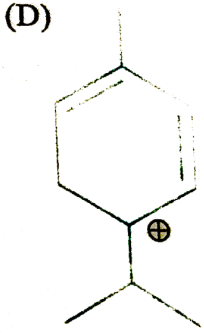
59. When  is reacted with conc. H_2SO_4 and heated then the intermediates and products formed are

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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60. Which of the following statement(s) is/are correct about benzene?

A. It burns with sooty flame

B. it undergoes electrophilic substitution reaction

C. Its resonance energy is 36 kcal mol^{-1}

D. It is highly unsaturated and decolourises bromine water.

Answer: A::B::C

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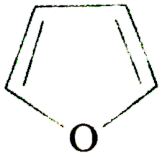
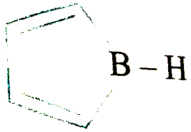
61. Which of the following heterocyclic compound/s might be aromatic?

A. (A) 

B. (B) 

C. (C) 

D. (D) 

Answer: B::C

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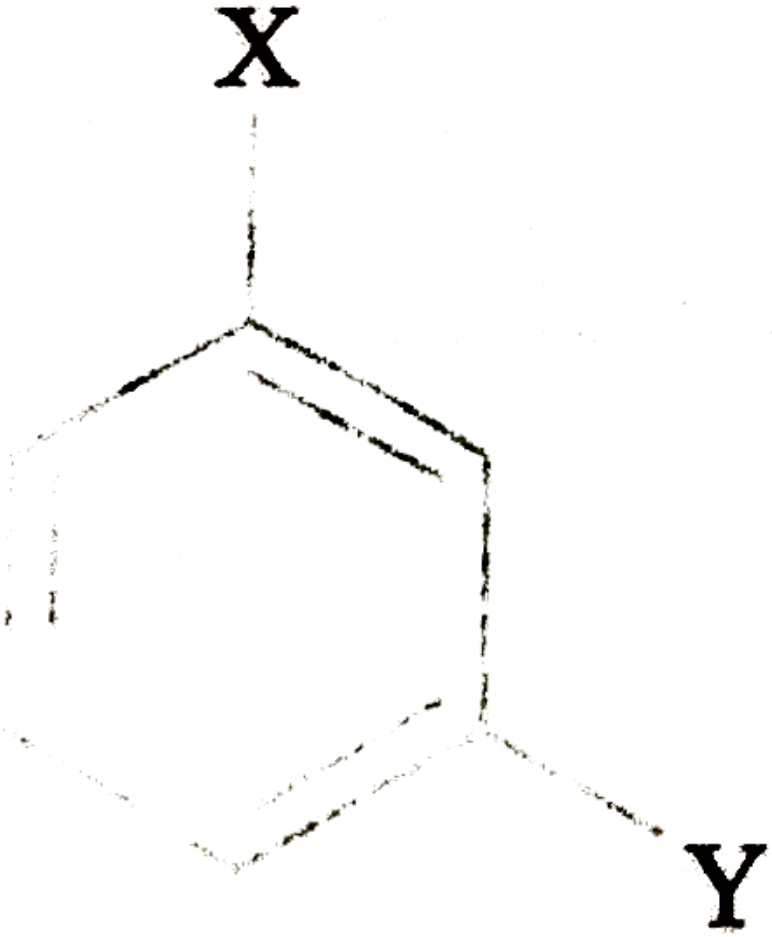
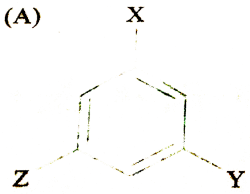
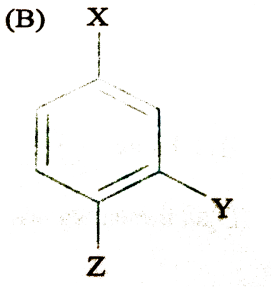
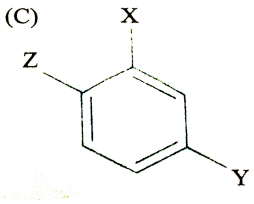
62. The compound



(where X is an O,P-directing group and Y is m-directing group) is subjected to electrophilic substitution reaction for introduction of Z. the compound formed would be

A. 

B. 

C. 

D. All (A) ,(B) and ©

Answer: B::C

View Text Solution

63. An aromatic molecule will

A. have $4n\pi$-electrons

B. have $(4n+2)\ \pi$- electrons

C. be planar

D. be cyclic

Answer: B::C::D

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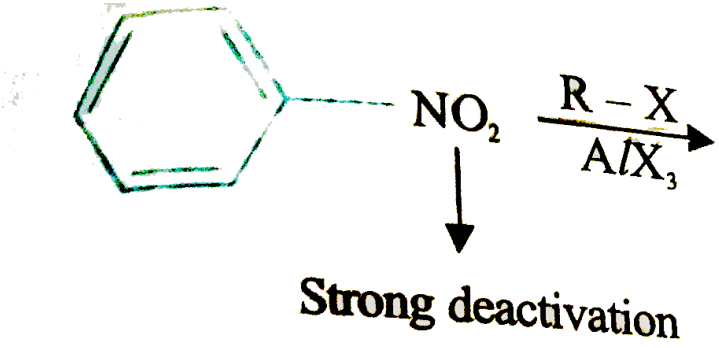
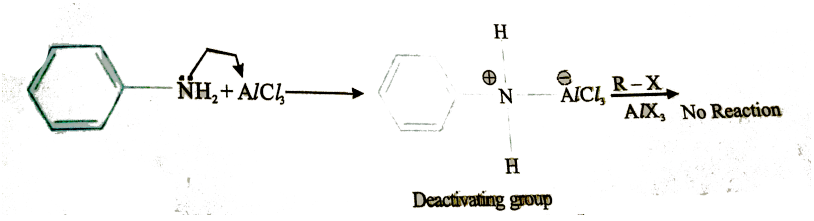
64. A benzene ring deactivated by strong & moderate electron withdrawing groups such a molecule is not electron rich enough to under go friedel-craft's reaction



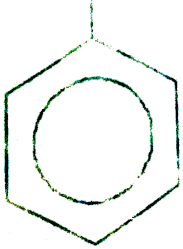
Friedel craft reaction also does not occur with NH_2 group as it react

with $AlCl_3$ and produce deactivating group.



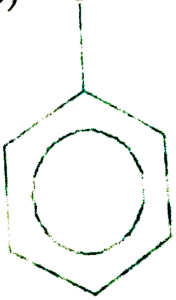
Q. Which of the following compound undergoes Friedel-crafts alkylation reaction

(A) SO_3H

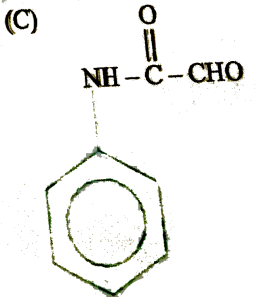


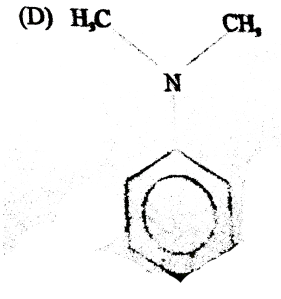
A.

(B) CHO



B.

C. 

D. 

Answer: C

View Text Solution

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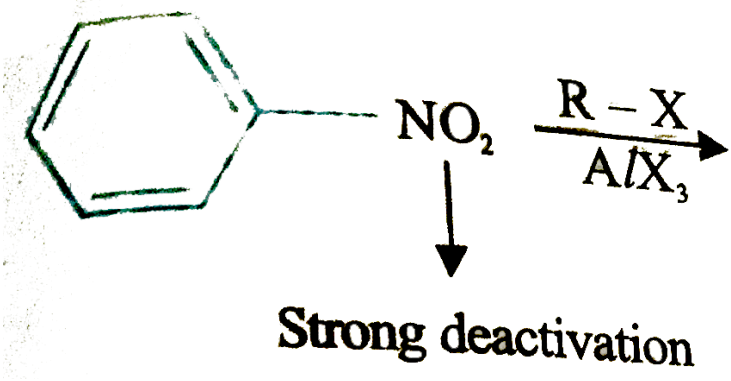
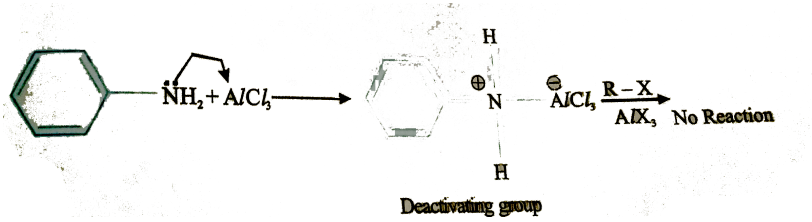
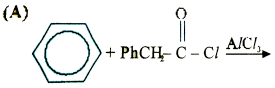
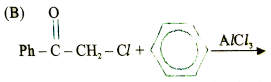


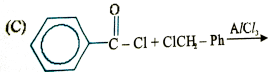
Friedel craft reaction also does not occur with NH_2 group as it react with $AlCl_3$ and produce deactivating group.



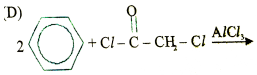
Q. Which of the following can not be starting material for this compound $Ph - \underset{\underset{O}{||}}{C} - CH_2 - Ph$

A. 

B. 

C. 

(D)

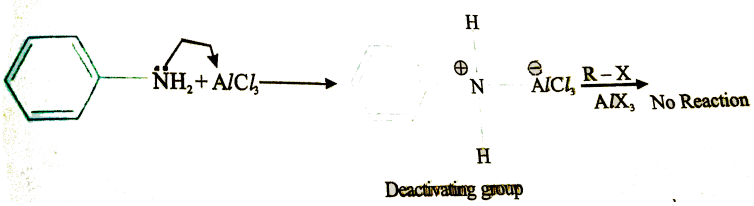


D.

Answer: C

View Text Solution

66. A benzene ring deactivated by strong & moderate electron withdrawing groups such a molecule is not electron rich enough to under go friedel-craft's reaction



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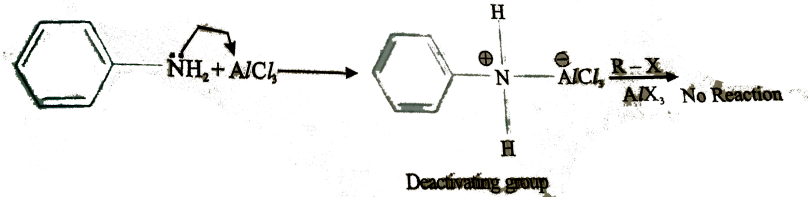
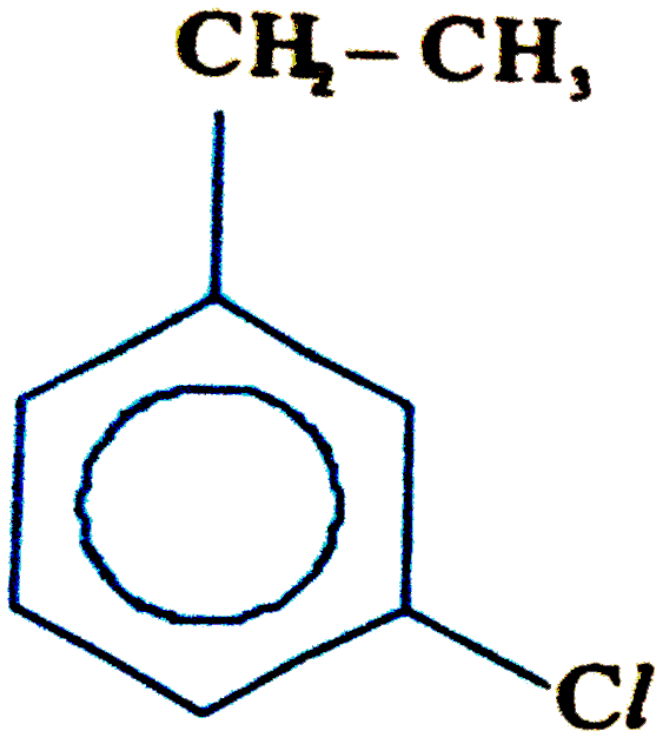
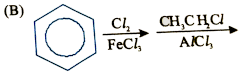


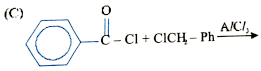
Q. Which of the following sequence of reaction is correct for the

synthesis of product



A. 

B. 

C. 

D. All are correct

Answer: C

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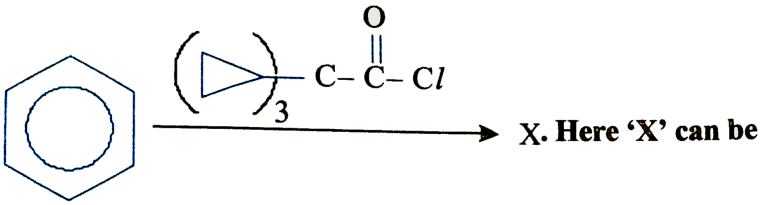
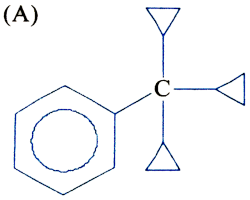
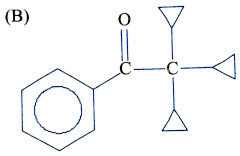
67. Benzene under goes electrophilic substitution reactions like nitration, sulphonation, halogenation, friedel crafts alkylation and friedel crafts acylation etc. . . Among these Friedel crafts alkylation and acylation are important, which are conducted in presence of lewis acid catalyst and suitable reagent.

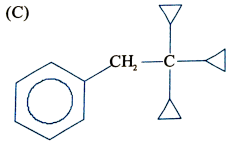


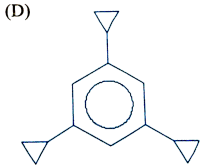
Q.

Here 'X' can be

A. 

B. 

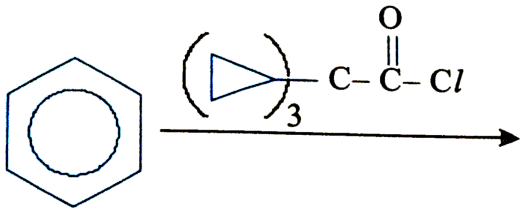
C. 

D. 

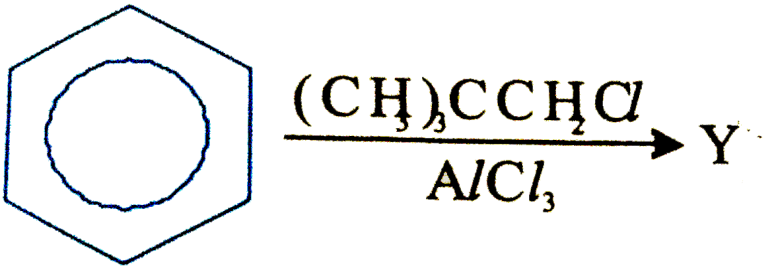
Answer: A

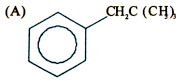
View Text Solution

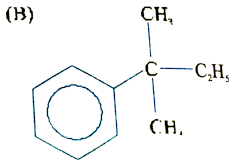
68. Benzene under goes electrophilic substitution reactions like nitration, sulphonation, halogenation, friedel crafts alkylation and friedel crafts acylation etc. . . Among these Friedel crafts alkylation and acylation are important, which are conducted in presence of lewis acid catalyst and suitable reagent.

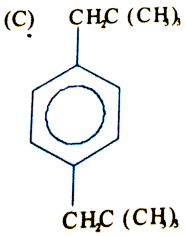
Q.  X. Here 'X' can be

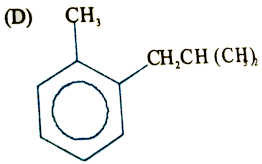
Here 'Y' is



A. 

B. 

C. 

D. 

Answer: B

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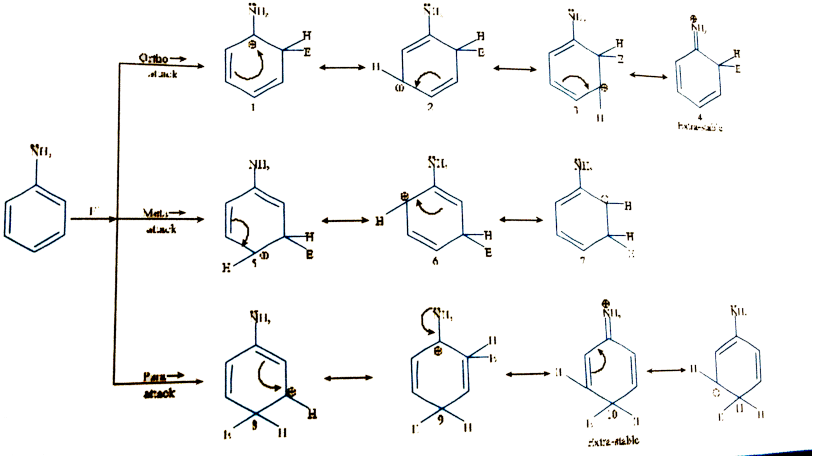
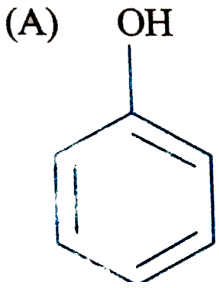
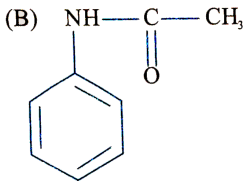


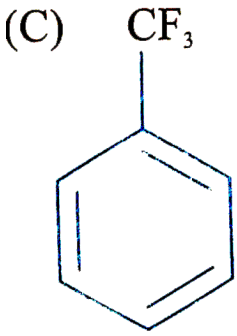
69.

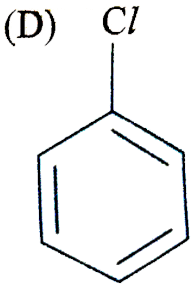
Directing nature of substituted aromatic compound is decided by stability of σ-complex or areniumion. If σ-complex is stabilised at O- and P-position by attacks of electrophile then the group is O-and P-directing, but if σ-complex si stabilisd at m-position the group will be meta directing on the basis of above explanation. find out correct answers of following questions.

Q. Which of the following is m-directing.

A. 

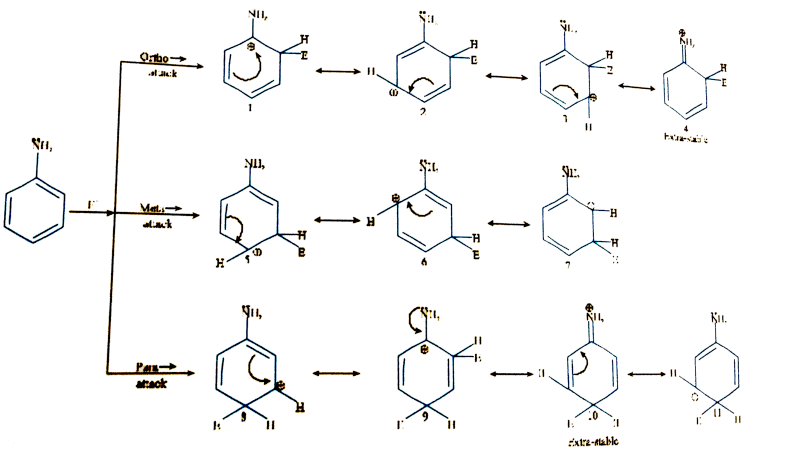
B. 

C. 

D. 

Answer: C

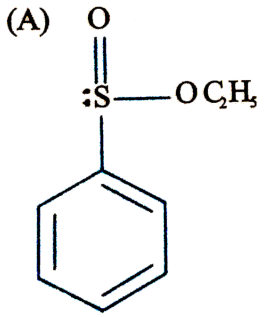
View Text Solution

70. 

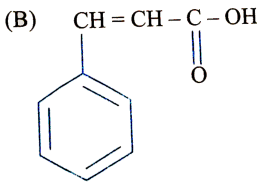
Directing nature of substituted aromatic compound is decided by stability of σ-complex or areniumion. If σ-complex is stabilised at O- and P-position by attacks of electrophile then the group is O-and P-directing, but if σ-complex si stabilisd at m-position the group will be meta directing on the basis of above explanation. find out correct answers of following questions.

Q. Which of the following is not O- and P-directing

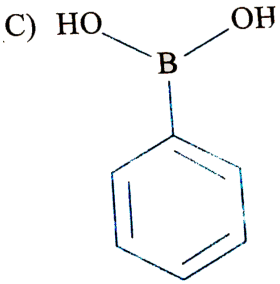
A.



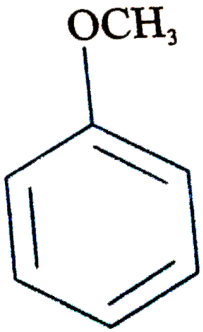
B.



C.



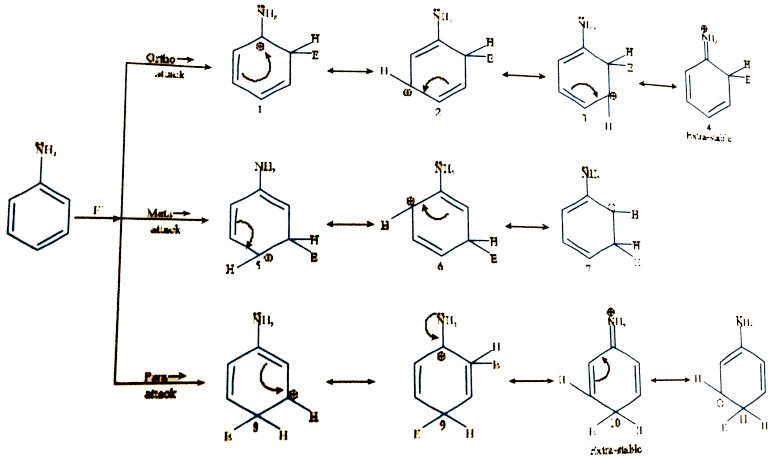
D.



Answer: C

View Text Solution

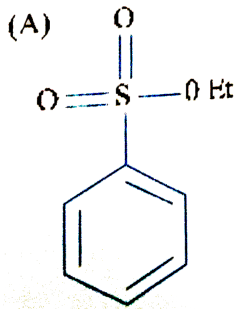
71.



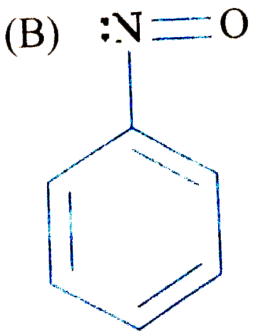
Directing nature of substituted aromatic compound is decided by stability of σ-complex or areniumion. If σ-complex is stabilised at O- and P-position by attacks of electrophile then the group is O-and P-directing, but if σ-complex si stabilisd at m-position the group will be meta directing on the basis of above explanation. find out correct answers of following questions.

Q. Which of the followin is -O- and p-directing

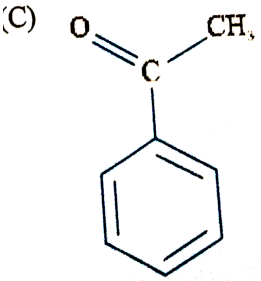
A.



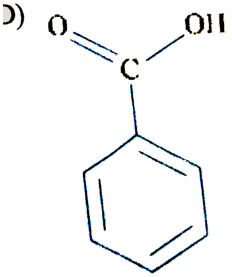
B.



C.



D.



Answer: B

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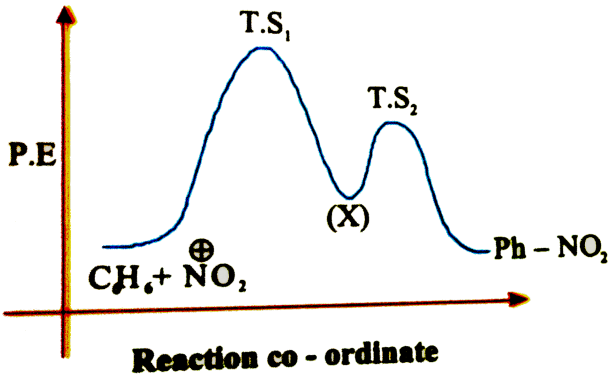
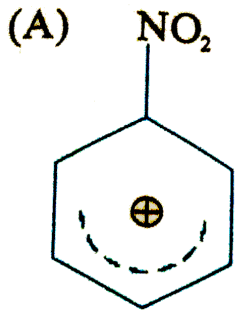
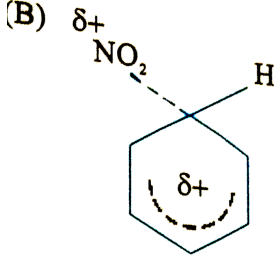
72. Given is the energy profile diagram of nitration of benzene using mixed acid $(HNO_3 + H_2SO_4)$



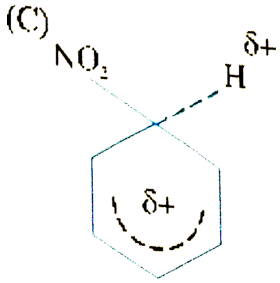
Q. Identify (X) in above reaction

A. 

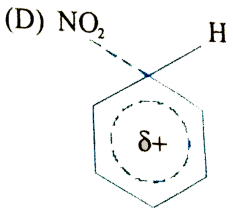
B.



C.



D.



Answer: A

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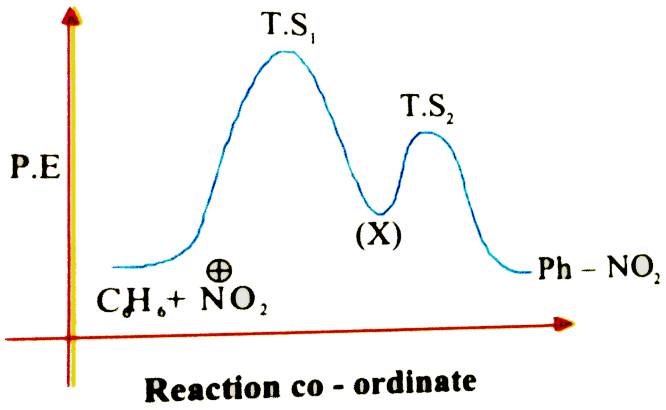
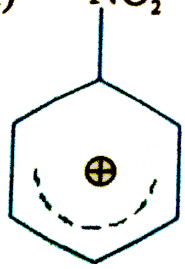
73. Given is the energy profile diagram of nitration of benzene using mixed acid $(HNO_3 + H_2SO_4)$

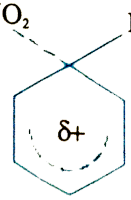


Q. Identify $T.\ S_1$ in the above reaction

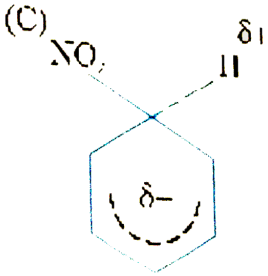
A. (A) NO_2



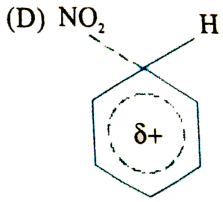
B. (B) $\delta+$ NO_2 H



C.



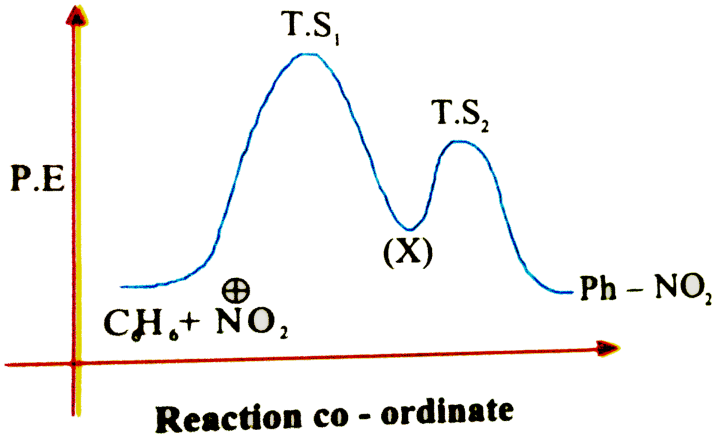
D.



Answer: B

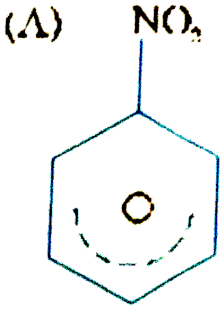
View Text Solution

74. Given is the energy profile diagram of nitration of benzene using mixed acid $(HNO_3 + H_2SO_4)$



Q. Identify $T.\ S_2$ in the above reaction

A.



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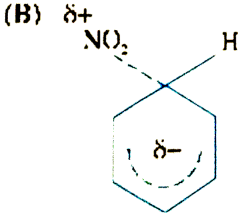
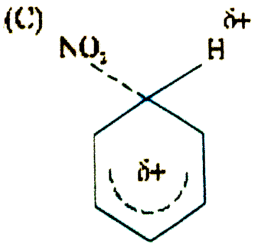
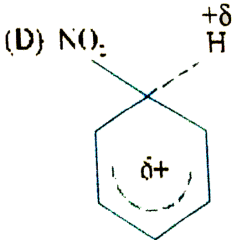


C.



D.



Answer: D

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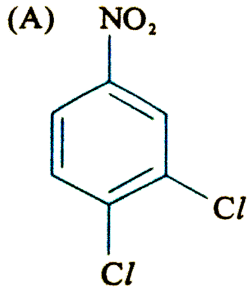
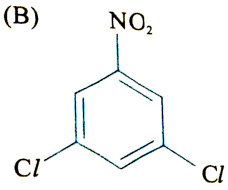
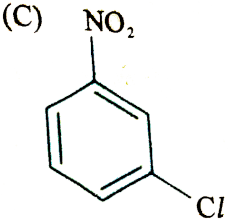
75. A third group is least likely to enter between two groups in the mta relationship. This is the result of steric hindrance and increases in importance with the size of the groups on the ring and with the size of the attaching species. When a meta-directing group is meta to an ortho-para directing group, the incoming group primarily goes

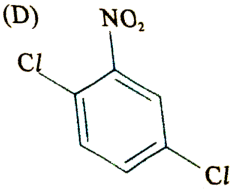
ortho to the meta directing group rather than para.

Q. Chlorination of m-chloro nitro benzene gives

A. 

B. 

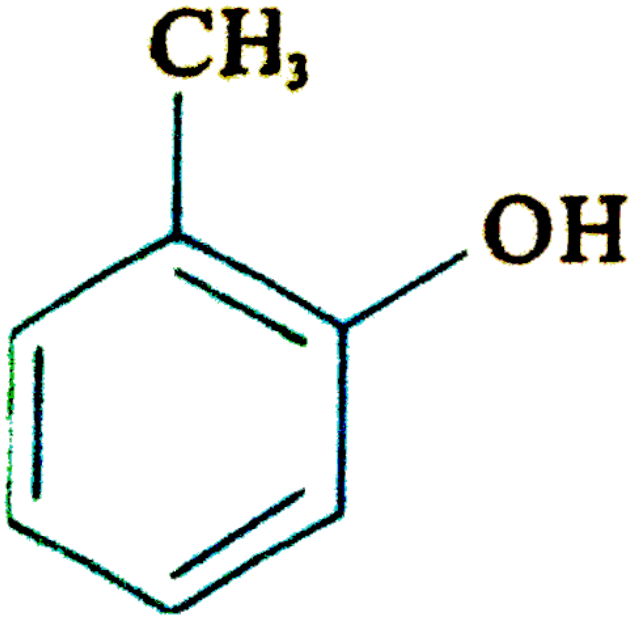
C. 

D. 

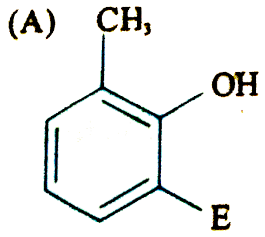
Answer: D

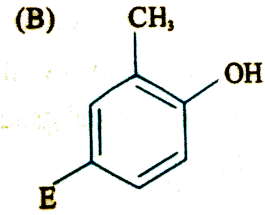
View Text Solution

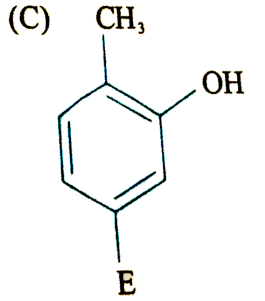
76. A third group is least likely to enter between two groups in the mta relationship. This is the result of steric hindrance and increases in importance with the size of the groups on the ring and with the size of the attaching species. When a meta-directing group is meta to an ortho-para directing group, the incoming group primarily goes ortho to the meta directing group rather than para.



Q.

A. 

B. 

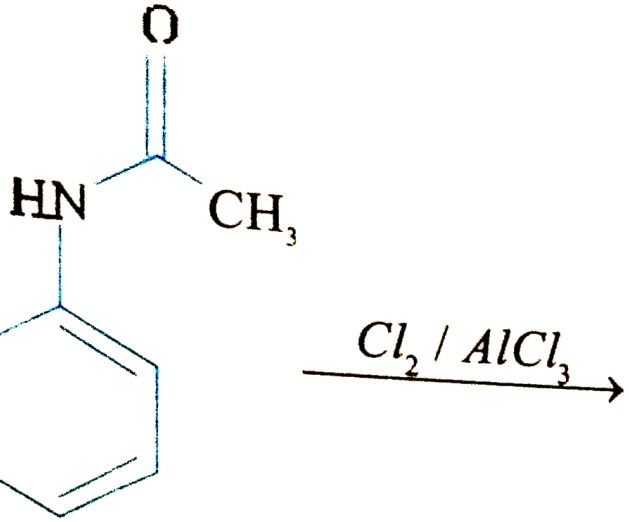
C. 

D. Both (A) and (B)

Answer: D

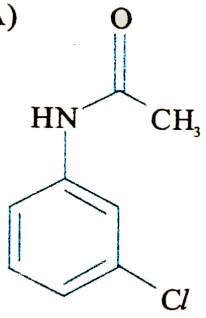
View Text Solution

77. A third group is least likely to enter between two groups in the mta relationship. This is the result of steric hindrance and increases in importance with the size of the groups on the ring and with the size of the attaching species. When a meta-directing group is meta to an ortho-para directing group, the incoming group primarily goes ortho to the meta directing group rather than para.



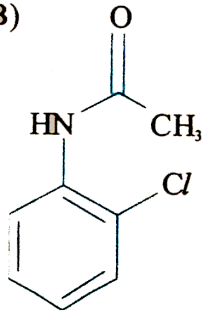
Q.

(A)



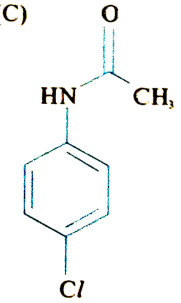
A.

(B)



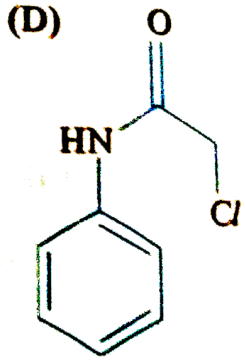
B.

(C)



C.

(D)



D.

Answer: C

View Text Solution

78. A third group is least likely to enter between two groups in the mta relationship. This is the result of steric hindrance and increases in importance with the size of the groups on the ring and with the size of the attaching species. When a meta-directing group is meta to an ortho-para directing group, the incoming group primarily goes

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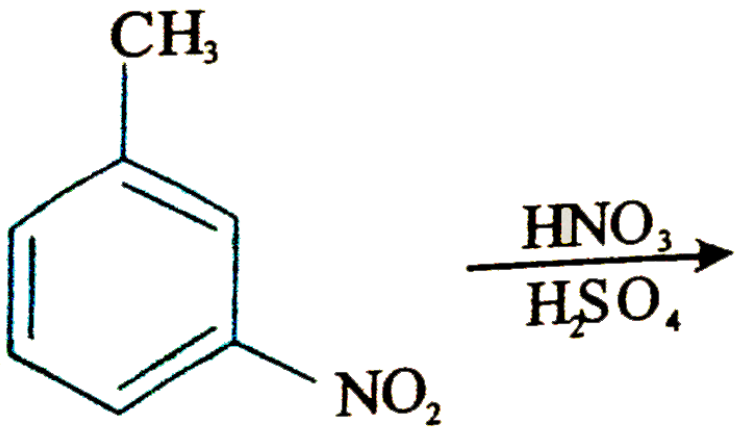
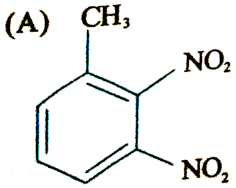
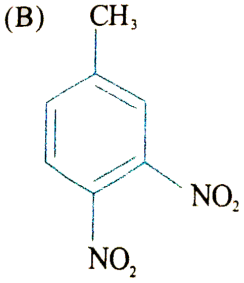
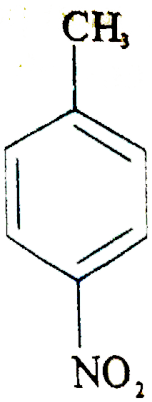


Q.

A. 

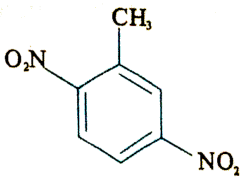
B. 

(C)



C.

D)



D.

Answer: B

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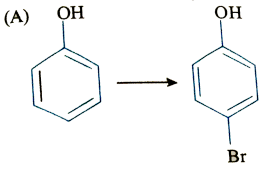
79. It is not always easy to predict the position of attack on multiple substituted benzene. If the benzene ring bears different ortho/para directing group at the 1 and 4 position, the position, the position of further substitution is not immediately clear. sometimes steric effect

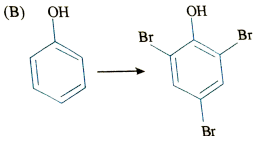
determine the outcome. in other cases, electronic factors determine the outcome, and further reaction will be at the position activated by the more strongly activating group. Some substituents are so strongly activating that no catalyst is needed to restrict the reaction to mono-substitution. It is possible to reduce the activity of such groups (by side chain reaction) so that the reaction can be stopped after mono substitution then and again by a side cahin reaction the original group is restored. effective use can sometimes be made of removable blocking groups on the ring.

Q. Which of the following synthesis could not be done without involving blocking position on the ring?

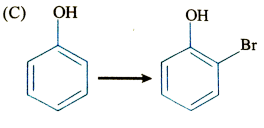
A.

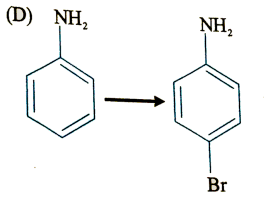


B.



C.



D. 

Answer: D

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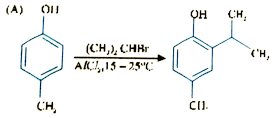
80. It is not always easy to predict the position of attack on multiple substituted benzene. If the benzene ring bears different ortho/para directing group at the 1 and 4 position, the position, the position of further substitution is not immediately clear. sometimes steric effect determine the outcome. in other cases, electronic factors determine the outcome, and further reaction will be at the position activated by the more strongly activating group. Some substituents are so strongly activating that no catalyst is needed to restrict the reaction to mono-substitution. It is possible to reduce the activity of such groups (by side chain reaction) so that the reaction can be stopped

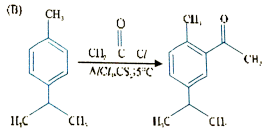
after mono substitution then and again by a side cahin reaction the original group is restored. effective use can sometimes be made of removable blocking groups on the ring.

Q. Which of the following is the correct major product?

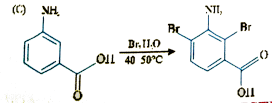
A.



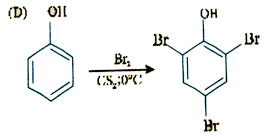
B.



C.



D.



Answer: B

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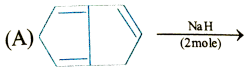
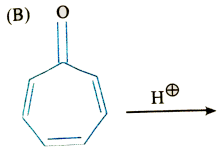
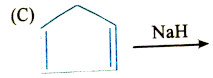
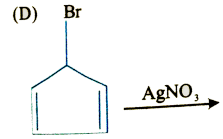
81.

COLUMN - I	COLUMN - II
(A) 	p) Product is aromatic
(B) 	q) Product if formed, is anti aromatic
(C) 	r) Product formed is planar compound
(D) 	s) H_2 gas will evolved in the reaction

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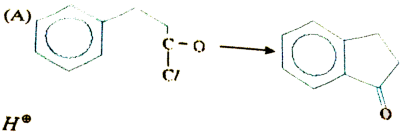
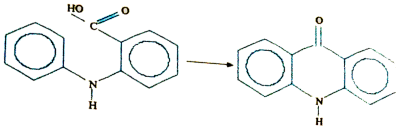
82.

COLUMN - I

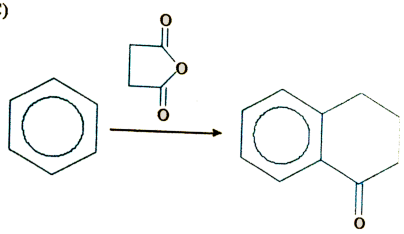
(A)



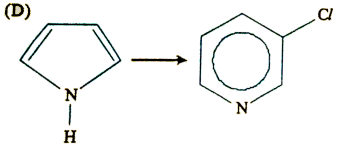
$H^{\oplus}$



(C)



(D)



COLUMN - II

p) $AlCl_3$, Reduction

q) $AlCl_3$

r) H^+

s) $CHCl_3$ / alcKOH

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COLUMN - I	COLUMN - II
A)Group donates electrons inductively not donate or withdraw electron by resonance	p) $-OCH_3$
B) Group deactivates the ring and directs ortho/para	q) $-Cl$
C) Group with draw electrons inductively, donates electrons by resonance, and activates the ring	r) $-\overset{+}{N}H_3$
D) Group withdraws electrons inductively but does not donate or withdraw electron by resonance	s)$-CH_3$

83.

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84. Match the following

	Column – I		Column - II
A)	Cyclic conjugated polyenes with $(4n + 2)\pi$ -electrons	(p)	Arenes and alkyl halides in presence of anhydrous $AlCl_3$
B)	o-dichlorobenzene does not exist as two isomers	(q)	Aromatic compounds
(C)	Friedel crafts reaction	(r)	Delocalization of π-electrons
(D)	Meta directing group	(s)	Deactivates the ring towards electrophilic substitution

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85. Match the following:

Column – I (compounds)	Column – II(no of π electrons)
(A) Naphthalene	(p) 10
(B) Furan	(q) 6
(C) Cyclopropene	(r) 4
(D) Cyclo octatetraene	(s) 2
	(t) 8

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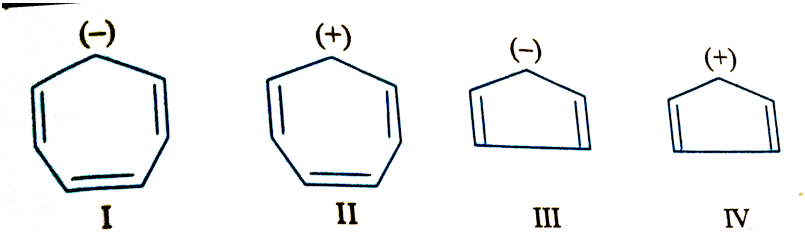
86. how many species would be expected to exhibit aromatic character?



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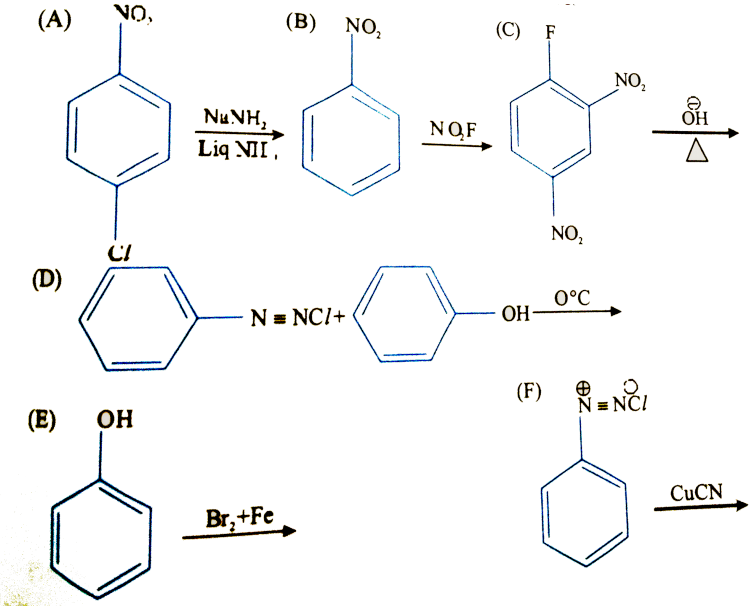
87. 

Find out the number of reactions that are electrophilic aromatic substitution aromatic substitution in nature.

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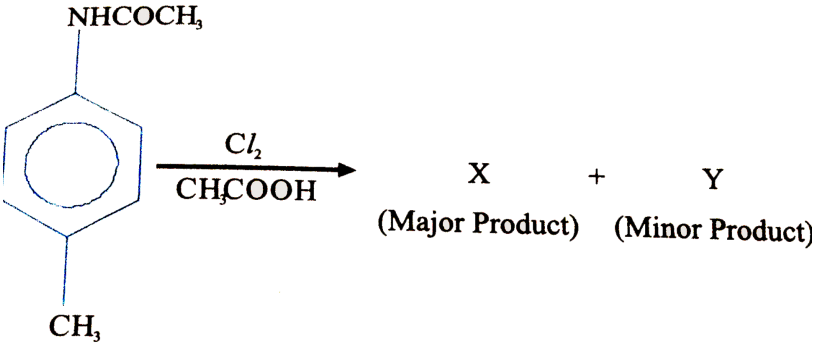

88.

The possition number of 'Cl' in the major product of the reactio (locant)

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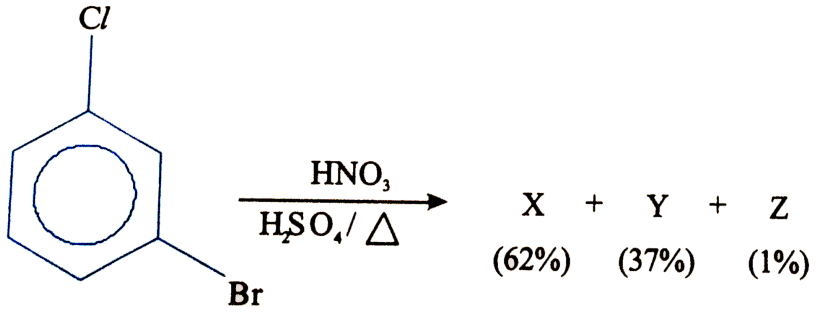

89.

Z the position number of NO_2 Group X,Y,Z aer P,Q,R respectively. The value of P+Q+R is

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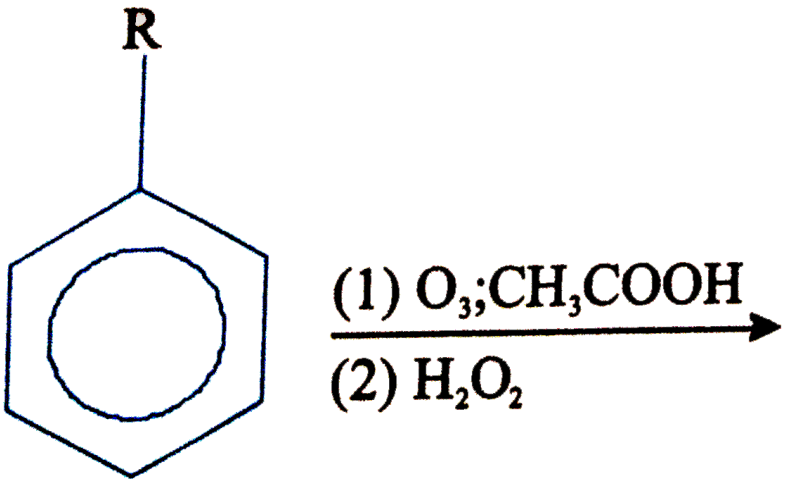

90. Products.

The total number of π bonds in the products is

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91. How many methods can be used for the preparation of iodobenzene?

(i). $C_6H_6 + I_2$

(ii). $C_6H_6 + I_2 \xrightarrow{HNO_3}$

A. $C_6H_5N_2 + Cl^- + KI$

B. $C_6H_6 + Ki \rightarrow$

C.

D.

Answer: 2

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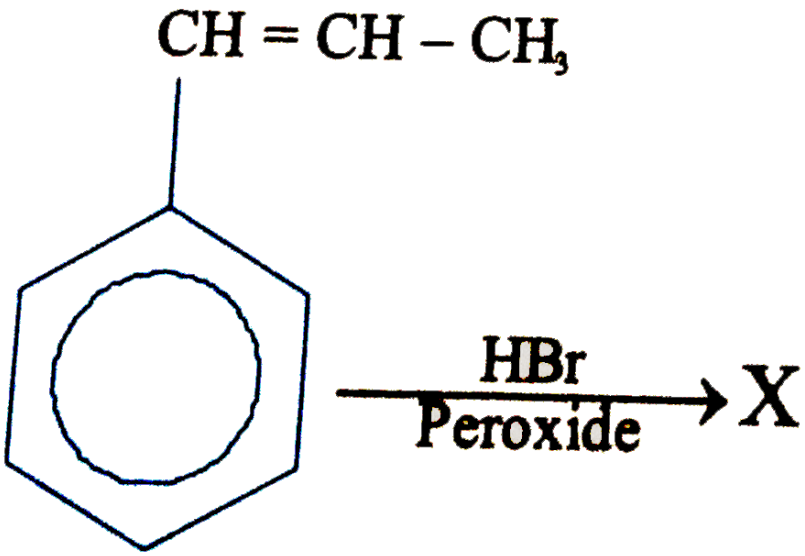
92. Complete the following reaction



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93. How many products are formed by the nitration of p-Xylene compound?

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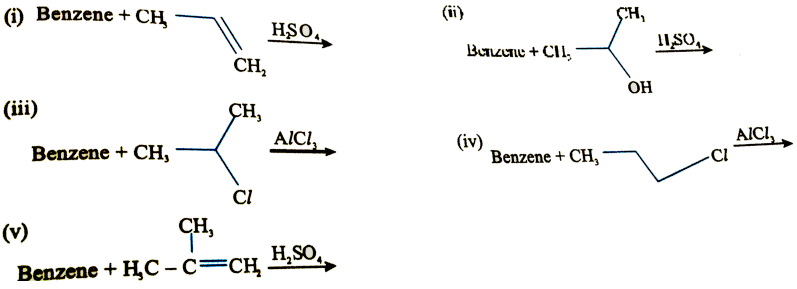
94. How many methods can be used for the preparation of the isopropyl benzene?



(v). Benzene $+H_3C-\overset{CH_3}{\underset{|}{C}}=CH_3 \xrightarrow{H_2SO_4}$

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95. Out of the following how many groups are meta directing?

(i). $-COOH$

(ii). $-CN$

(iii). $-COCH_3$

(iv). $-NHCOCH_3$

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96. Statement-I : Nitration of toluene is easier than benzene

Because

Staement-II : The methyl group in touene is electron-releasing

A. Statement-1, is true, statement-2 is true, statement-2 is a correct explanation for statement -1.

B. Statement-1 is true, statement-2 is true, statement-2 is NOT a correct explanation for statement-1

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: A

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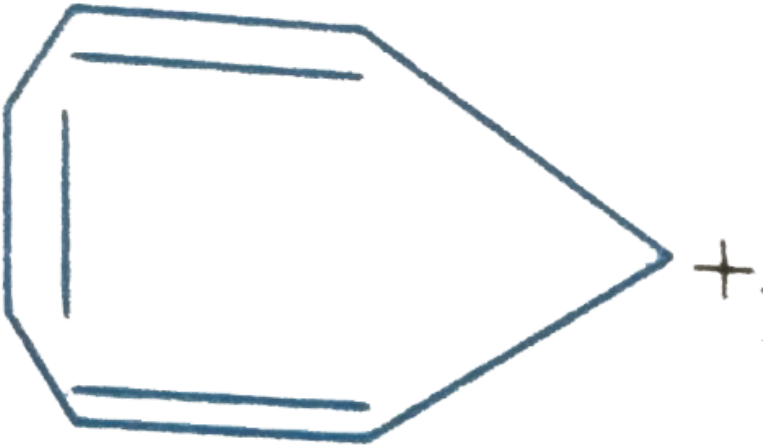
97. Statement-1: Tropylium cation



is aromatic in nature

Statement-2: The only property that determines its aromatic behaviour is its planar structure.

A. Statement-1, is true, statement-2 is true, statement-2 is a correct explanation for statement -1.

B. Statement-1 is true, statement-2 is true, statement-2 is NOT a correct explanation for statement-1

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: C

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98. (A) Benene does not decolorise alkaline $KMnO_4$.

(R) Benzene is stabilized by resonance and $\pi =$ electron are delocalized.

A. Statement-1, is true, statement-2 is true, statement-2 is a correct explanation for statement -1.

B. Statement-1 is true, statement-2 is true, statement-2 is NOT a correct explanation for statement-1

C. Statement-1 is true, statement-2 is false.

D. Statement-1 is false, statement-2 is true.

Answer: A

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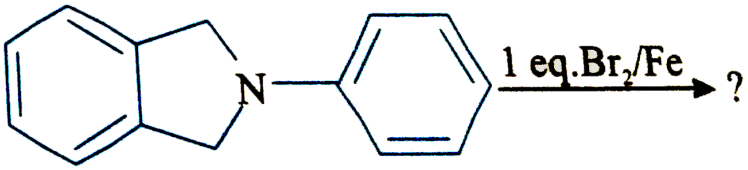
99. What would e the major product in following reaction?



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100. When benzene is treated with DCl at low temperatures a compound C_6H_6DCl, is formed. On warming the reactants, C_6H_6 and DCl are re-formed. However, in the presence of $AlCl_3$ an isomer of C_6H_6DCl is produced, which on warming, gives mainly C_6H_5D and HCl. Explain.

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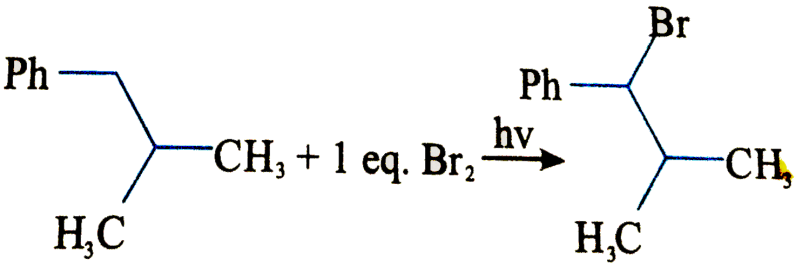
101. Accound for the following



with ittle or no $PhCH_2(Br)CH_3)_2$ formed.

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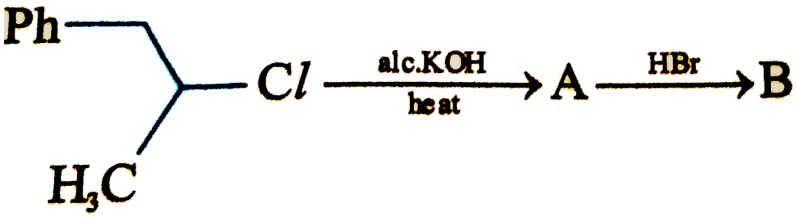
102. Complete the following reaction



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103. Oxidation of toluene by acidic $KMnO_4$ gives poor yield of benzoic acid while oxidation of p-nitrotoluene gives good yield of p-nitrobenzoic acid. Why?

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104. What happens when p-xylene is treated with concentrated sulphuric acid and the resultant product is fused with KOH and finally dilute acid is added?

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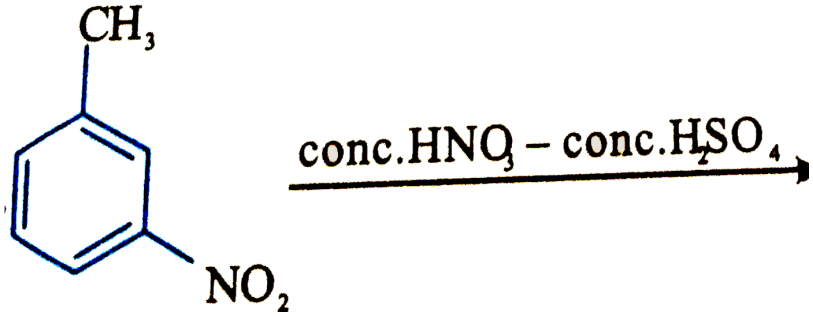
105. 

In the above reaction, product is most likely to be formed?

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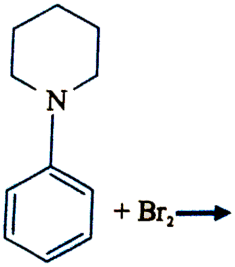
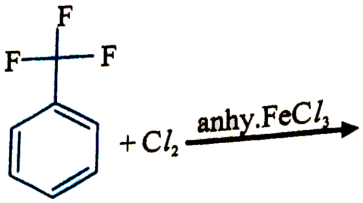
106. Give the product of the following reactions

(a) 

(b) 

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107. A compound $D(C_8H_{10}O)$ upon treatement with alkaline solution of iodine gives a yellow precipitate. The fibtrate on acidification gives a white solid $E(C_7H_6O_2)$. Write the structures of D,E .

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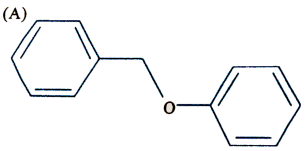
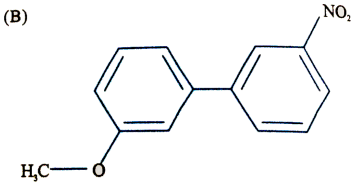
108. Give the product(s) obtained from the reaction each of the following compounds with $Br_2 / FeCl_3$.

(A)



(B)



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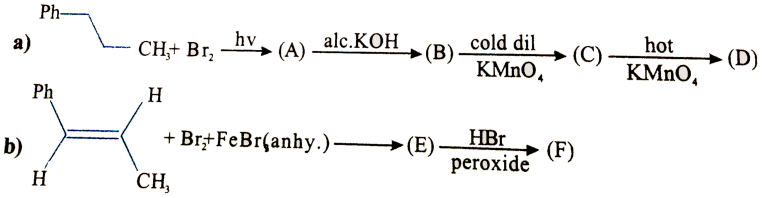
109. Write the structures of the compounds from the following data.



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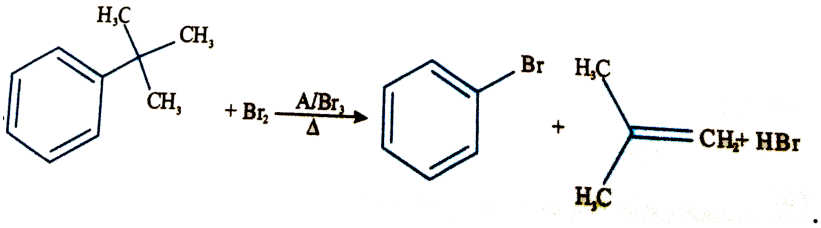
110.



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111. Compound (A) and (B) are isomers having C_8H_{10}. On oxidation (A) gives benzoic acid while (B) gives phthalic acid which forms an anhydride (C) on heating. Identify (A), (B) and (C).

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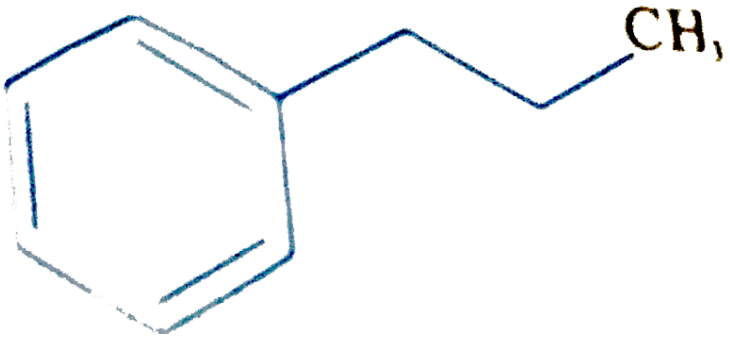
112. How will you synthesize



from benzene?

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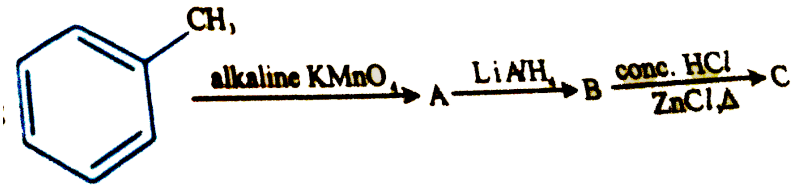
113. Identify A to C in the following



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114. Complete the following reaction:

a). 4-bromo-2-methylphenol treated with 2-methylpropene and sulphuric acid

(b). P-cresol treated with propanoyl chloride and aluminium chloride.

c). 2,5-dichlorophenol reacts with chlorine in acetic acid.

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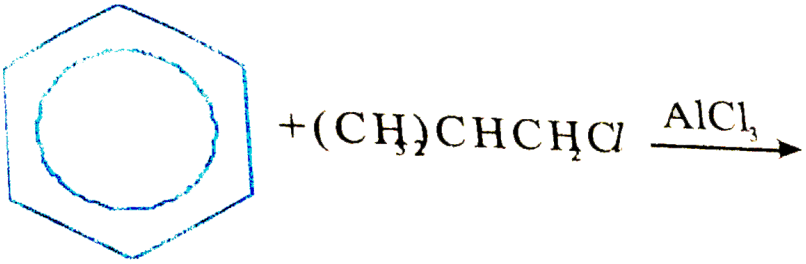
115. Write the structure of the major organic products expected from the following reaction



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116. Predict the major products in the following reaction:

(i). $C_6H_6 + (CH_3)_2CHCH_2OH \xrightarrow{H_2SO_4} \ldots$

(ii). $C_6H_5C_2H_5 \xrightarrow[2.NaCN]{1.Br_2 \quad \text{heat,light}} \ldots$

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117. give reasons for following in one or two sentence:

"Nitrobenzene does not undergo Friedal Craft's reaction".

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118. 7-bromo-1,3,5-cycloheptatriene exists as ionic species in aqueous solution while 5-bromo-1,3-cyclopentadiene doesn't ionise even in presence of $Ag^+(aq)$, Explain.

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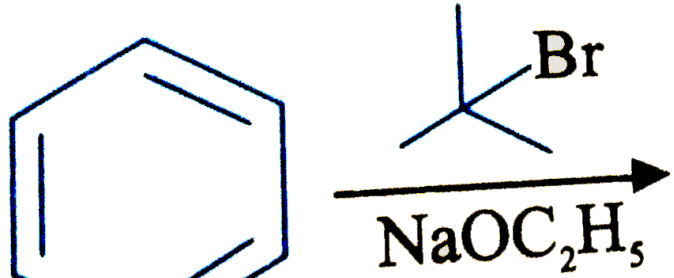
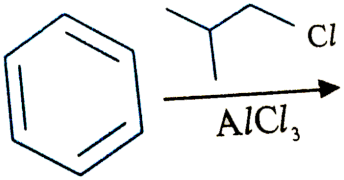
119. Among the following reaction(s) which gives(give) tert-butyl benzene as the major product is(are)

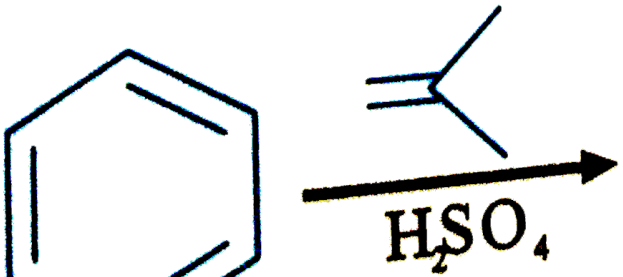
A)



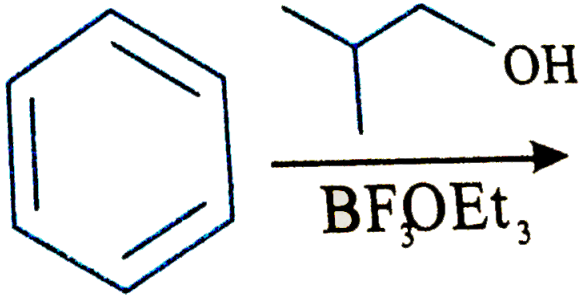
B)



C)



D)



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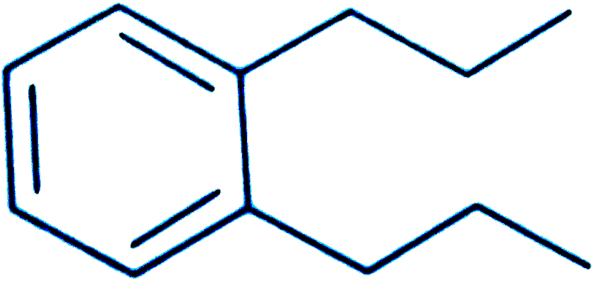
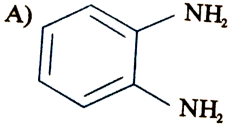
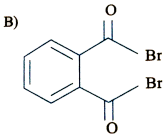
120. Treatment of compound O with $KMnO_4 / H^+$ have P, which on heating with ammonia gave Q. The compound Q on treatment with $Br_2 / NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropanoate in the presence of KOH followed by acidification, gave a compound T.

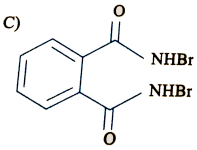


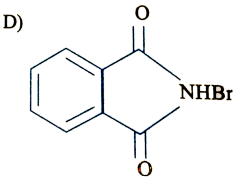
(O)

Q. The compound R is

A. 

B. 

C. 

D. 

Answer: A

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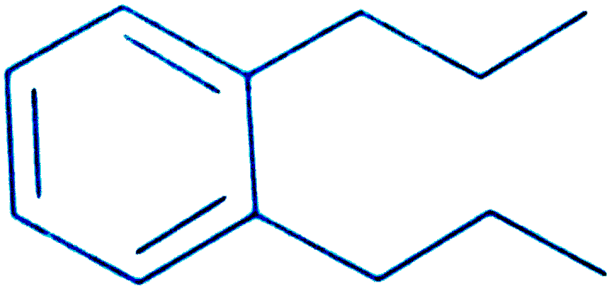
121. Treatment of compound O with $KMnO_4/H^+$ have P, which on heating with ammonia gave Q. The compound Q on treatment with $Br_2/NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropanoate in the presence of KOH followed by acidification, gave a compound T.



(O)

Q. The compound T is

A. glycine

B. alanine

C. valine

D. serine

Answer: B

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