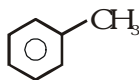


SELECT THE CORRECT ALTERNATIVE (ONLY ONE CORRECT ANSWER)

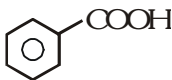
1. The correct order of reactivity towards the electrophilic substitution of the compounds aniline (I), benzene (II) and nitrobenzene (III) is :-

(A) III > II > I (B) II > III > I (C) I < II > III (D) I > II > III

2. Which of the following order is correct for the decreasing reactivity to ring monobromination of the following compounds :-



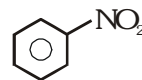
I



II



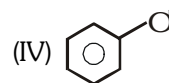
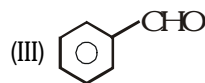
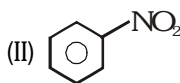
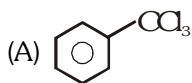
III



IV

(A) I > II > III > IV (B) II > III > IV > I (C) I > III > II > IV (D) III > I > II > IV

3. Electrophile NO_2^+ attacks the following :



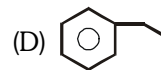
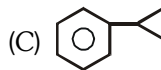
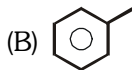
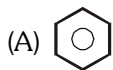
in which cases NO_2^+ will attack at meta position

(A) II and IV (B) I, II and III (C) II and IV (D) I only

4. The strongest deactivating effect on aromatic ring is

(A) $-\text{CH}_2\text{Cl}$ (B) $-\text{OCH}_3$ (C) $-\text{CH}_3$ (D) $-\text{CCl}_3$

5. Which of the following is maximum reactive for nitration is :-



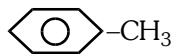
6. The order of decreasing reactivity towards electrophilic reagent for the following :

(a) Benzene (b) Toluene

(c) Chloro benzene (d) Anisole

(A) b > d > a > c (B) d > c > b > a (C) d > b > a > c (D) a > b > c > d

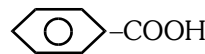
7. Increasing order of the following for electrophilic substitution reaction as -



(I)



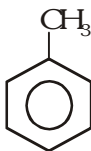
(II)



(III)

(A) I < II < III (B) III < II < I (C) II < III < I (D) I < III < II

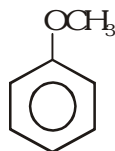
8. Among the compounds :



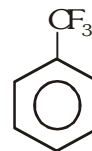
(I)



(II)



(III)



(IV)

the order of decreasing reactivity towards electrophilic substitution is :

(A) II > I > III > IV (B) III > I > II > IV (C) IV > I > II > III (D) I > II > III > IV

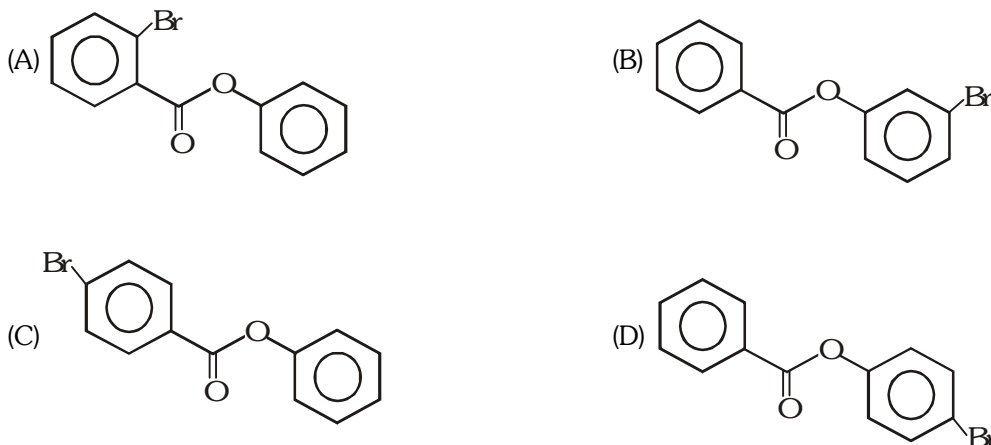
9. Choose the most reactive among the following compound :



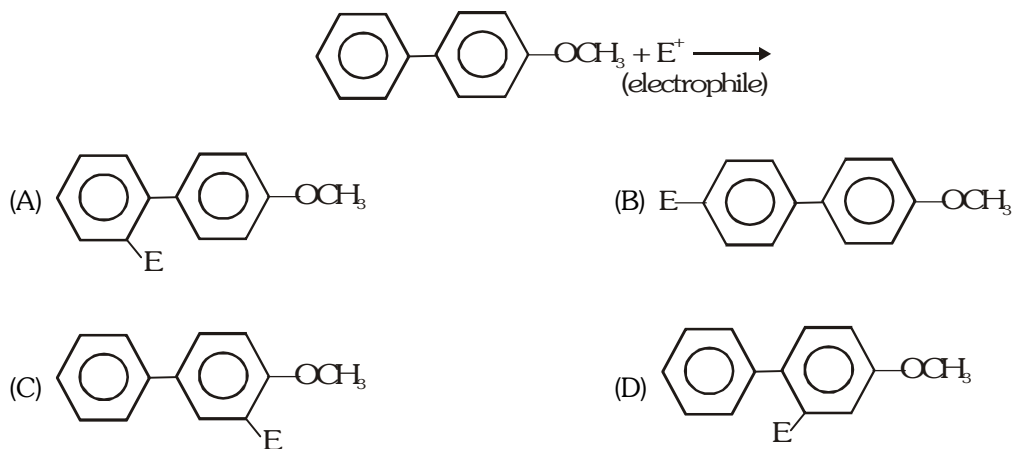
10. The number of possible dichloronitrobenzene isomers is :

- (A) 3 (B) 4 (C) 6 (D) 8

11. The major product formed on monobromination of phenylbenzoate is :



12. The major product formed in the reaction is :



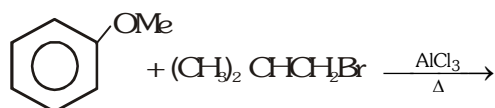
13. The electrophilic aromatic substitution of a compound C_6H_5Y produces mainly a meta-disubstituted product. Among the following which one could be the substituent Y ?

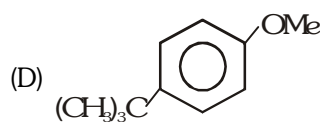
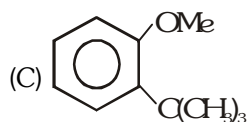
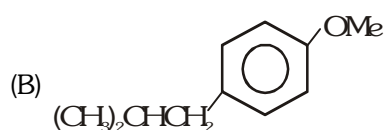
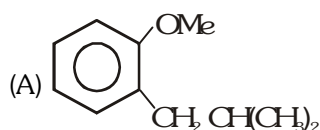
- (A) $-NH_2$ (B) $-COOH$ (C) $-CH_3$ (D) $-OCH_3$

14. Which of the following is an o-, p-directing but deactivating substituent in an electrophilic aromatic substitution :

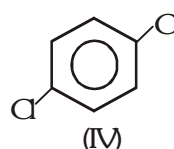
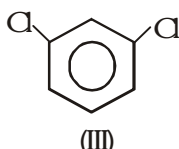
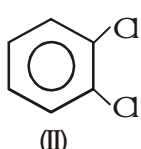
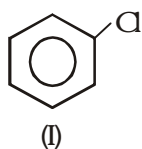
- (A) $-CCl_3$ (B) $-Cl$ (C) $-NHCOCH_3$ (D) $-OCH_3$

15. The major product formed in the reaction is :

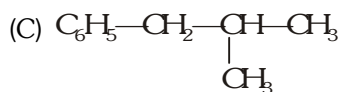
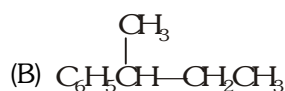
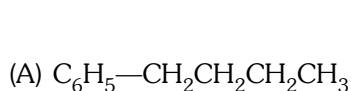




16. The dipole moment of chlorobenzene is 1.6 D. The expected dipole moment of meta-dichlorobenzene is:
 (A) 1.6 D (B) 3.2 D (C) $1.6\sqrt{2}$ D (D) 0.0 D
17. In the nitration of benzene with a mixture of concentrated HNO_3 and concentrated H_2SO_4 , the active species involved is :
 (A) NO_3^- (B) NO_2 (C) NO_2^- (D) NO_2^+
18. Which of the following substituted benzene derivatives would produce three isomeric products when one more substituent is introduced ?

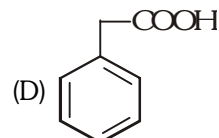
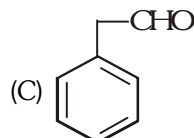
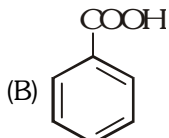
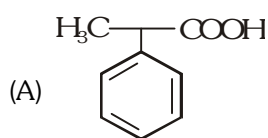


- (A) I, II and III (B) I and III (C) II and IV (D) I and IV
19. In the sulphonation of benzene, the active electrophilic species is :
 (A) SO_2 (B) SO_3 (C) SO_4^{2-} (D) HSO_4^-
20. The Friedel-Crafts reaction of benzene with n-butyl chloride at 0°C produces :

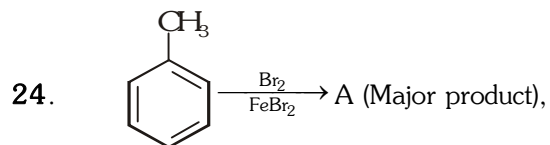


(D) all of these

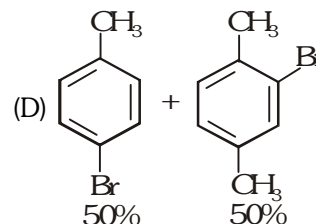
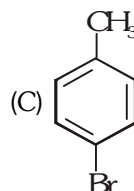
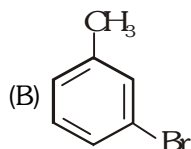
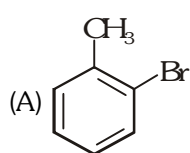
21. Sulfonation differs from most of electrophilic aromatic substitution reactions with the fact that the reaction-
 (A) is reversible (B) requires Lewis acid as catalyst
 (C) is explosive (D) takes place at high temperature
22. Cumene on treatment with KMnO_4 gives -



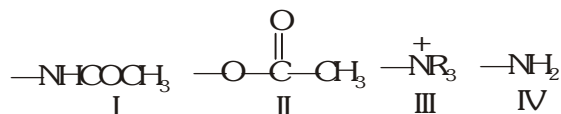
23. Benzene reacts with CH_3COCl in the presence of anhyd. AlCl_3 to give :
 (A) $\text{C}_6\text{H}_5\text{CH}_3$ (B) $\text{C}_6\text{H}_5\text{Cl}$ (C) $\text{C}_6\text{H}_5\text{O}_2\text{Cl}$ (D) $\text{C}_6\text{H}_5\text{COCH}_3$



then the major product A is -



25. Arrange the following in correct activating order towards EAS -

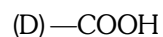
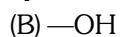
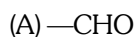


- (A) $\text{III} < \text{I} < \text{II} < \text{IV}$ (B) $\text{IV} < \text{I} < \text{II} < \text{III}$
 (C) $\text{III} < \text{II} < \text{I} < \text{IV}$ (D) $\text{II} < \text{III} < \text{I} < \text{IV}$

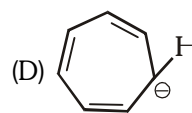
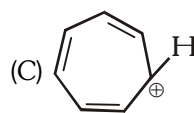
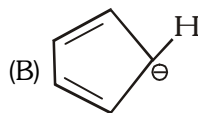
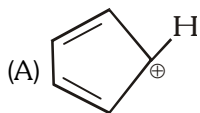
CHECK YOUR GRASP						ANSWER KEY					EXERCISE -1				
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	C	B	D	B	C	B	B	B	C	D	C	B	B	D
Que.	16	17	18	19	20	21	22	23	24	25					
Ans.	A	D	B	B	A	A	B	D	A	C					

SELECT THE CORRECT ALTERNATIVES (ONE OR MORE THEN ONE CORRECT ANSWERS)

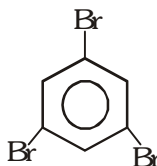
1. Which of the following groups are m-directing :



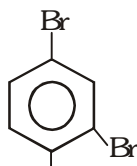
2. Amongst the ions the aromatic species are :



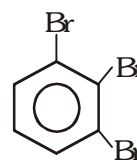
3. The following three isomeric tribromobenzenes are subjected to mononitration, which is/are given two isomers :



(I)



(II)



(III)

Which of these would produce three possible mononitrotribromobenzenes :

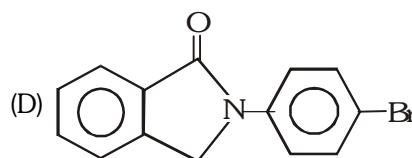
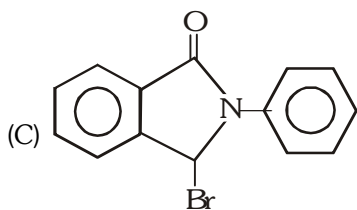
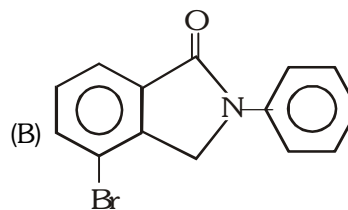
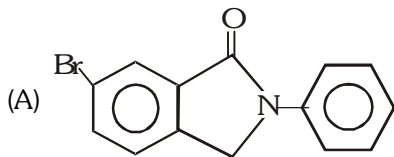
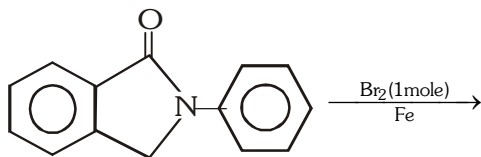
(A) II and III

(B) I and II

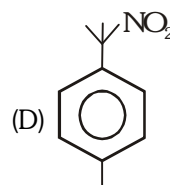
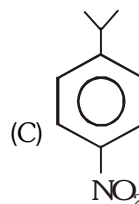
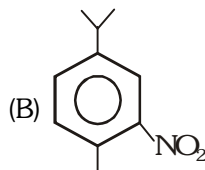
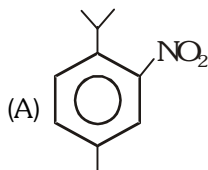
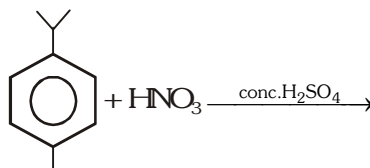
(C) II

(D) III

4. In the reaction the major product formed is :

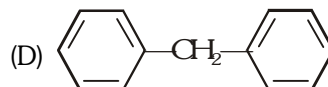
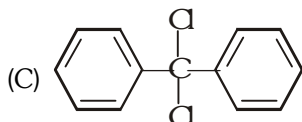
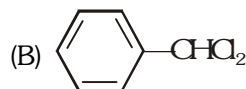
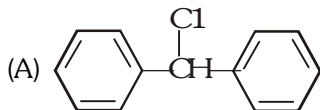


5. The major product formed in the reaction is :

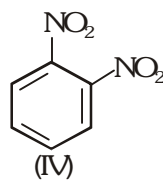
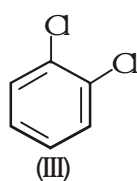
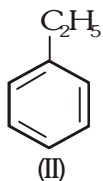
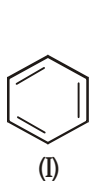


6. Nitrobenzene reacts with Br_2 in the presence of FeBr_3 to give m-bromonitrobenzene as the major product. Which of the following provides the best reason for the formation of m-bromonitrobenzene as the major product :
- The electron density at the meta position is greater than those at the ortho and para positions
 - Aromaticity is lost in the σ -complexes formed by the attack of Br^+ at the ortho and para positions but not at the meta position.
 - The σ -complex formed by the attack of Br^+ at the meta position is the least destabilized and the most stable among the three σ -complexes
 - In the final step of regeneration of benzene ring by the loss of H^+ from the σ -complexes, the meta-oriented σ -complex loses H^+ most readily
7. Isopropylbenzene can be prepared by :
- Benzene + $\text{CH}_3\text{CH}=\text{CH}_2 \xrightarrow{\text{H}_2\text{SO}_4}$
 - Benzene + $\text{CH}_3-\underset{\text{Cl}}{\underset{|}{\text{CH}}}-\text{CH}_3 \xrightarrow{\text{H}_2\text{SO}_4}$
 - Benzene + $\text{CH}_3-\underset{\text{Cl}}{\underset{|}{\text{CH}}}-\text{CH}_3 \xrightarrow{\text{AlCl}_3}$
 - Benzene + $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} \xrightarrow[\Delta]{\text{AlCl}_3}$
8. Which of the following characteristic does an aromatic compound exhibit :
- It should have $(4n + 2)$ π -electrons in the ring
 - It should be planar and conjugated
 - It should have $4n$ π -electrons in the ring
 - It should possess high resonance energy
9. Which of the following groups are meta-directing :
- $-\text{NH}_2$
 - $-\text{OH}$
 - $-\text{NO}_2$
 - $-\text{CN}$
10. Which of the following groups are ortho-and para-directing :
- $-\text{OH}$
 - $-\text{CHO}$
 - $-\text{CN}$
 - $-\text{NHCOCH}_3$
11. Which of the following statements are correct :
- An activating group is an electron-releasing group
 - An activating group activates all positions of the benzene ring
 - The effect of any group—whether activating or deactivating—is the strongest at the ortho-and para-positions in the benzene ring
 - An activating group activates only the ortho-and para-positions in the benzene ring
12. The major products formed in the reaction of toluene with chlorine in the presence of ferric chloride are:
- o-chlorotoluene
 - m-chlorotoluene
 - p-chlorotoluene
 - benzyl chloride
13. Benzene can undergo :
- substitution
 - addition
 - elimination
 - oxidation
14. Which of the following statements about the nitration of aromatic compounds are correct :
- The rate of nitration of toluene is greater than that of benzene
 - The rate of nitration of benzene is almost the same as that of hexadeutrobenzene
 - The rate of nitration of benzene is greater than that of hexadeutrobenzene
 - Nitration is an electrophilic substitution reaction

15. Halogenation of benzene in presence of AlCl_3 (anhy.) is :
 (A) nucleophilic substitution (B) nucleophilic addition
 (C) electrophilic substitution (D) free radical substitution
16. Which of the following structures correspond to the product expected, when excess of C_6H_6 reacts with CH_2Cl_2 in presence of anhydrous AlCl_3 ?



17. Select the incorrect statement among the following :
 (A) benzene undergoes predominantly electrophilic substitution reactions
 (B) toluene is more easily sulphonated than benzene
 (C) benzene reacts with CCl_4 in the presence of anhydrous AlCl_3 to give triphenyl methyl chloride
 (D) benzene reacts with chlorine (Cl_2) in presence of light to give benzyl chloride
18. Identify the correct order of reactivity in electrophilic substitution reactions of the following compounds:



- (A) $\text{I} > \text{II} > \text{III} > \text{IV}$ (B) $\text{IV} > \text{III} > \text{II} > \text{I}$
 (C) $\text{II} > \text{I} > \text{III} > \text{IV}$ (D) $\text{II} > \text{III} > \text{I} > \text{IV}$
19. The structure of Wheland intermediate obtained after the attack of Br^+ on anilinium ion is :

