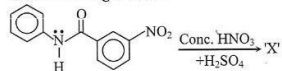
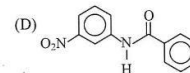
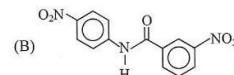
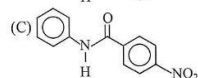
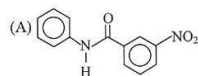


Single Correct Option Type Questions

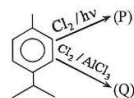
Q.1 In the following reaction:



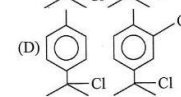
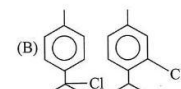
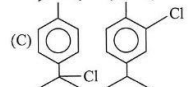
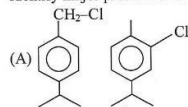
the structure of major product 'X' is -



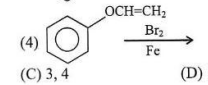
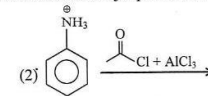
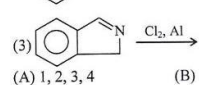
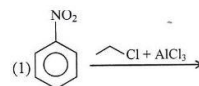
Q.2



Identify major product of both respectively



Q.3 Which of the following will form a significant meta substituted major product during the reaction (if any)

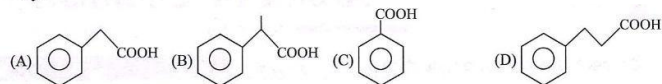
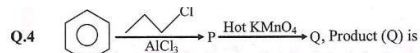


(A) 1, 2, 3, 4

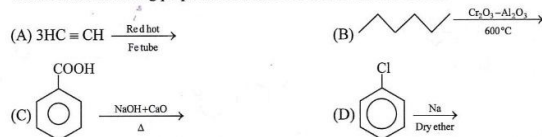
(B) 1, 2, 3

(C) 3, 4

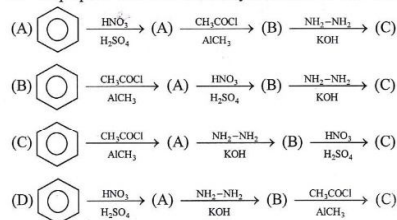
(D) 3



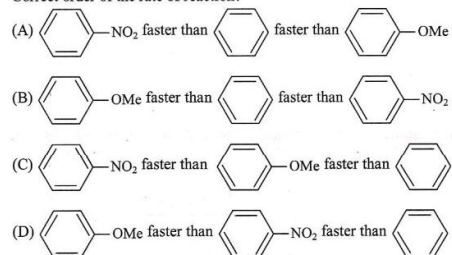
Q.5 Which of the following preparation method for benzene is not correct



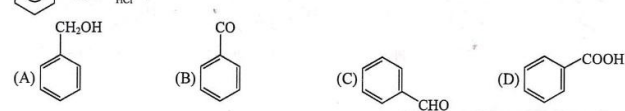
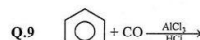
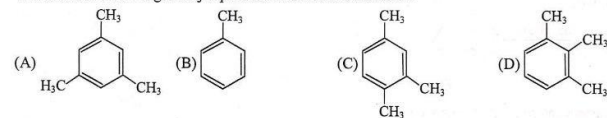
Q.6 For the preparation of meta nitro ethyl Benzene which is the best method



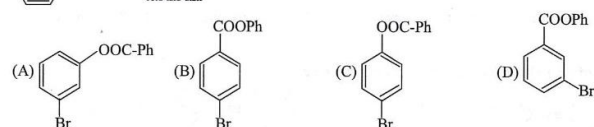
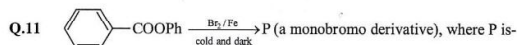
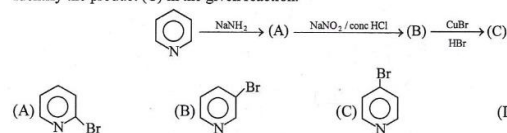
Q.7 Nitrobenzene, benzene and anisole are subjected to electrophilic aromatic nitration with HNO_3 , H_2SO_4 . Correct order of the rate of reaction?



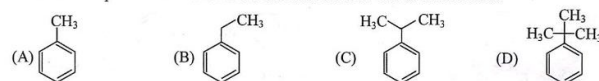
Which of the following is major product of the above reaction ?



Q.10 Identify the product (C) in the given reaction.

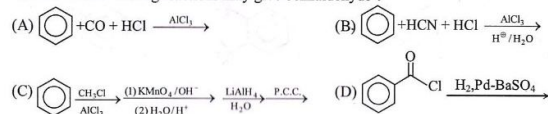


Q.12 Rate of electrophilic bromination in the aromatic nucleus will be maximum in

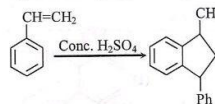


Multiple Correct Option Type Questions

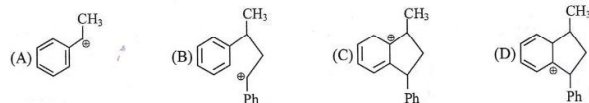
Q.13 Which of the following reactions may give benzaldehyde ?



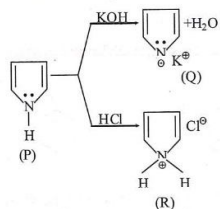
Q.14 Styrene undergoes following reactions in acidic medium,



The various intermediate formed are -

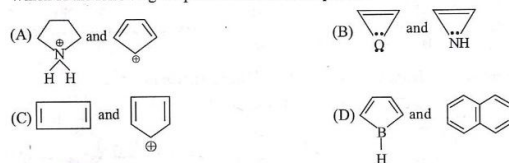


Q.15 Which is true about following reactions ?

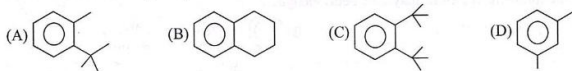


- (A) P is aromatic (B) Q is aromatic (C) R is antiaromatic (D) R is non aromatic

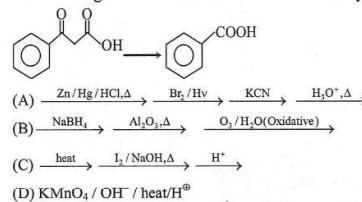
Q.16 Which of the following are pairs of antiaromatic species ?



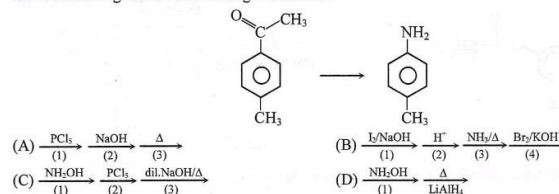
Q.17 Which of the following compound when reacts hot KMnO_4 form phthalic acid ?



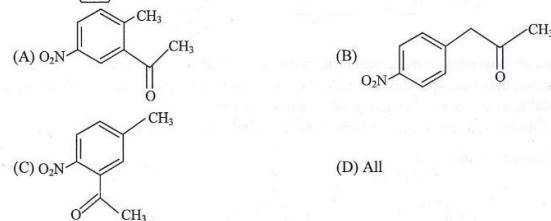
Q.18 The following conversion reaction can be carried out by using reaction sequence/s :



Q.19 The suitable reagents of the following reaction are



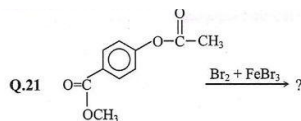
Q.20 $\text{O}_2\text{N}-\text{C}_6\text{H}_4-\text{CH}_3 \xrightarrow[\text{CH}_3\text{COCl}]{\text{EtO}^-} \text{B}$



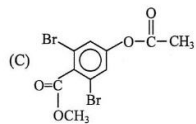
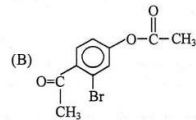
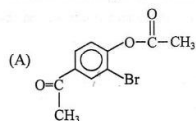
Passage Based Questions

Passage # 1 (Ques. 21 – 22)

If aromatic ring is substituted by more than groups then electrophilic aromatic substitution reacting take place according to more activating group. Types of group which donate electron in aromatic ring known as activating groups.

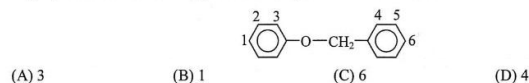


Find out correct product of reaction -



(D) No reaction

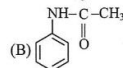
Q.22 Major product formation take place at which position in this reaction -



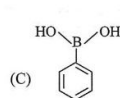
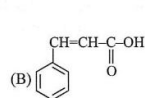
Passage # 2 (Ques. 23 – 25)

Directing nature of substituted aromatic compound is decided by stability of σ -complex or arenium ion. If σ -complex is stabilize at o- and p-position by attack of electrophile then the group is o-and p-directing but if σ -complex is stabilize at m-position then group will be meta directing. On the basis of above explanation find out correct answers of following questions.

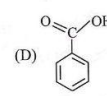
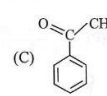
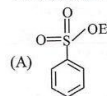
Q.23 Which of the following is m-directing ?



Q.24 Which of the following is not o-and p-directing ?



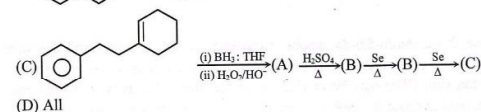
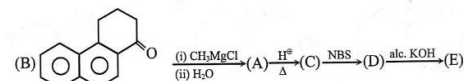
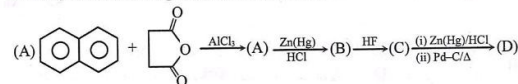
Q.25 Which of the following is o-and p-directing ?



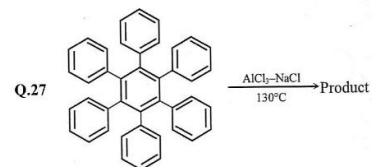
Passage # 3 (Ques. 26 – 27)

As the number of fused aromatic rings increases, the resonance energy per ring continues to decrease and the compounds become more reactive. Tricyclic Phenanthrene has only 14 pi electrons in its three aromatic rings, compared with 18 electrons for three separate benzene that's why Phenanthrene can undergo addition reactions which is the characteristic reactions of polycyclic aromatic compound.

Q.26 In which of the following reaction final product is Phenanthrene



(D) All



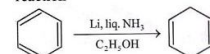
Double bond equivalent of product is

(A) 31 (B) 32 (C) 33 (D) 34

Passage # 4 (Ques. 28 – 29)

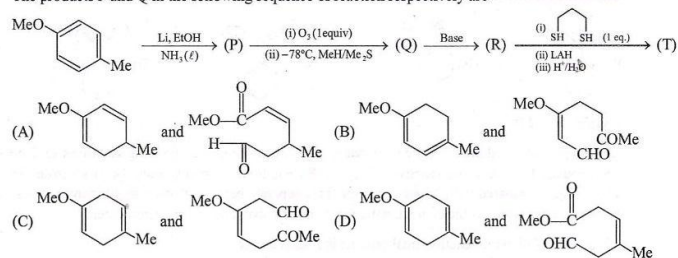
Birch Reduction

When aromatic rings are reduced with Na, K or Li in liquid ammonia or amine in the presence of alcohol, addition of hydrogen takes place at positions-1 and -4 to give an unconjugated diene. This is known as Birch reaction

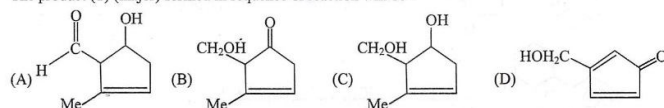


Liquid ammonia serves as solvent

Q.28 The products P and Q in the following sequence of reaction respectively are

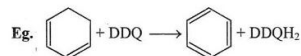
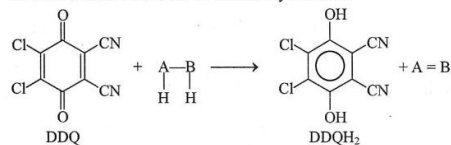


Q.29 The product (T) (major) formed in sequence of reaction will be -

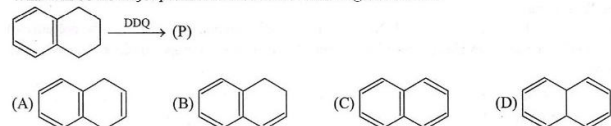


Passage # 5 (Ques. 30 – 31)

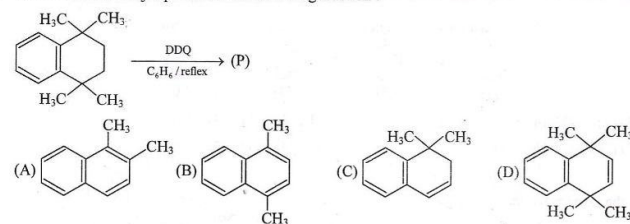
The high potential quinone, 2,3-dichloro-5,6-dicyanobenzoquinone (DDQ), is a powerful dehydrogenating agent. Initially it was used for the dehydrogenation of hydroaromatic compounds. Later its use was extended to the steroid field. Reaction with DDQ may be carried out in the inert solvents such as benzene, toluene dioxane, THF, but dioxane and hydrocarbon solvents are often preferred, because DDQH₂ formed in these solvents is insoluble and can be removed by filtration.



Q.30 What will be the major product formed in the reaction given below ?



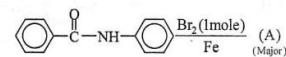
Q.31 What will be the major product of the following reaction ?



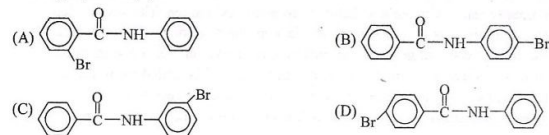
Passage # 6 (Ques. 32 – 33)

Aromatic compounds undergo electrophilic aromatic substitution under suitable condition. The orientation and reactivity of the substituted benzene depends upon the nature of substituent. If more than one substituent are there, then the product depends upon the competing orienting effect of the substituents.

Q.32 In the following reaction:



The major product (A) is



Q.33 Which of the following atom or group is ortho – para directing and deactivating?



Passage # 7 (Ques. 34 – 35)

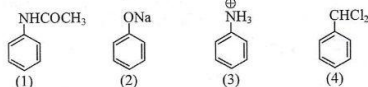
Benzene and other aromatic rings have tendency to undergo electrophilic aromatic substitution reaction and do not undergo electrophilic addition reactions like alkenes and alkynes.

Monosubstituted benzenes undergo substitution reactions either faster or slower than benzene depending on the fact that whether the group is electron donating or electron withdrawing, respectively. The directive influence of a group is determined by the fact that the arenium formed by the attack of electrophile on a particular position is more stable than the arenium ion formed by attacking other positions.

Side chain oxidation of benzene gives benzoic acid irrespective of the length or nature of the side chain.

Read the above paragraph carefully and give the answer of following questions :

Q.34 Rank the following compounds in the decreasing order of their reactivity towards electrophilic substitution.



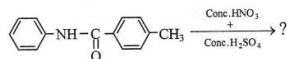
(A) (1) > (2) > (4) > (3)

(B) (2) > (1) > (4) > (3)

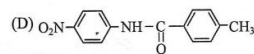
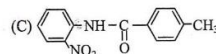
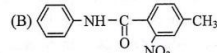
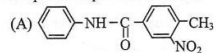
(C) (2) > (1) > (3) > (4)

(D) (4) > (1) > (2) > (3)

Q.35 In the given reaction,

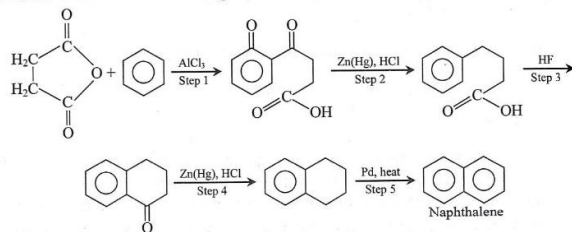


the probable product would be



Page # 8 (Ques. 36 – 38)

The Lewis acid usually reacts with the acyl halide to form an acylium ion. The acylium ion is stabilized by resonance. The acylium ion acts as an electrophile attacking the benzene ring to form an arenium ion. The arenium ion then loses a proton to generate the final product. Powerful electron withdrawing groups on the benzene ring such as another acyl group will retard this reaction. Naphthalene is the simplest and most important of the fused ring hydrocarbons. Five percent of all constituents of coal tar are naphthalene. Naphthalene can be manufactured using the Friedel-Crafts reaction via the reaction pathway shown below :



Q.36 The Friedel-Crafts reaction occurs twice in the given sequence of reactions. Which two steps represent Friedel-Crafts reactions ?

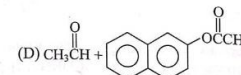
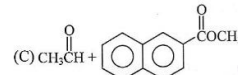
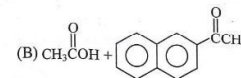
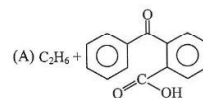
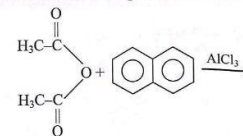
(A) Steps 1 and 3

(B) Steps 1 and 5

(C) Steps 2 and 4

(D) Steps 3 and 5

Q.37 What are the most likely products of the following reaction ?

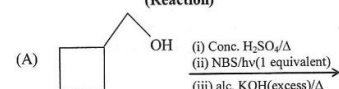
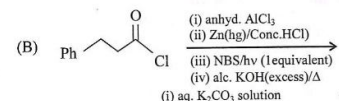
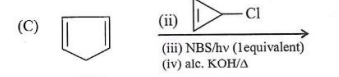
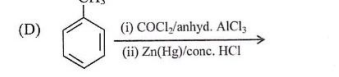


Q.38 Which of the following is an acylium ion ?



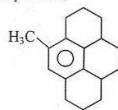
Column Matching Type Questions

Q.39 Match the reaction in Column-I with the characteristics of corresponding organic product in Column-II

Column-I (Reaction)	Column-II (Characteristics of organic product)
(A) 	(p) Aromatic
(B) 	(q) All carbon atoms in the ring are sp^2 hybridised
(C) 	(r) Non-aromatic
(D) 	(s) Bicyclic
	(t) At least one carbon atom is sp^3 hybridised

Numeric Response Type Questions

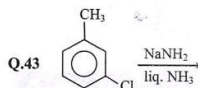
Q.40 Total number of α -hydrogen in given compound is



Q.41 Total number of different organic products obtained on complete reductive ozonolysis of following compound.

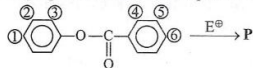


Q.42 How many groups are o, p directing but deactivating
 $-\text{COOCH}_3$, $-\text{NHCOCCH}_3$, $-\text{CHO}$, $-\text{Cl}$, $-\text{CONH}-\text{CH}_3$, $-\text{CCl}_3$, $-\text{NH}_2$, $-\text{S}(=\text{O})-\text{CH}_3$, $-\text{N}(\text{CH}_3)_2$

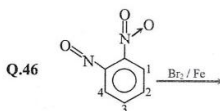
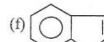


In above reaction how many isomeric product will be formed ?

Q.44 Major product formation take place at which position in this reaction.



Q.45 x = Number of compounds which become aromatic after reaction with KH.



The major substitution is taking place at position

ANSWER KEY

Single Correct Option type Questions

- | | | | | | | |
|--------|--------|---------|---------|---------|--------|--------|
| 1. (B) | 2. (C) | 3. (D) | 4. (C) | 5. (D) | 6. (B) | 7. (B) |
| 8. (A) | 9. (C) | 10. (A) | 11. (C) | 12. (A) | | |

Multiple Correct Option type Questions

- | | | | | | | |
|---------------|---------|-------------|-------------|---------|-------------|-----------|
| 13. (A,B,C,D) | 14. () | 15. (A,B,C) | 16. (A,B,D) | 17. (B) | 18. (B,C,D) | 19. (B,C) |
| 20. (B) | | | | | | |

Passage Based Questions

- | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|
| 21. (A) | 22. (C) | 23. (C) | 24. (C) | 25. (B) | 26. (D) | 27. (D) |
| 28. (D) | 29. (A) | 30. (C) | 31. (D) | 32. (B) | 33. (C) | 34. (B) |
| 35. (D) | 36. (A) | 37. (B) | 38. (D) | | | |

Column Matching Type Questions

39. [A \rightarrow P,Q; B \rightarrow P,Q,S; C \rightarrow P,Q,S; D \rightarrow Q,R,S,T]

Numeric Response Type Questions

- | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|
| 40. (9) | 41. (3) | 42. (2) | 43. (3) | 44. (1) | 45. (2) | 46. (2) |
|---------|---------|---------|---------|---------|---------|---------|