



GGSRDN

Educational Services Private Limited

9th, 10th, NEET, JEE(Main/Advanced)

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GGSRDN

ORGANIC CHEMISTRY

DPP

FOR CLASS 12th

Set Your Target and Keep Try in Until You Reach It.

DPP 1 TO 32

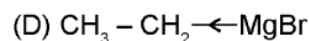
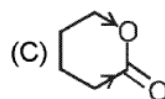
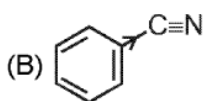
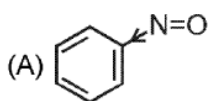
FOR CLASS 12th

GGSRDN : Website : www.ggsrdn.com, Email ID : ggsrdn1@gmail.com
Help No. Whatsapp No. : 9466076100

Topic : General Organic Chemistry
Type of Questions

		M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4,7, 8	(3 marks, 3 min.)	[18, 18]
Multiple choice objective ('-1' negative marking) Q.5 to Q.6	(4 marks, 4 min.)	[8, 8]
Comprehension ('-1' negative marking) Q.7 to Q.8	(3 marks 3 min.)	[6, 6]
Subjective Questions ('-1' negative marking) Q.9	(4 marks 5 min.)	[4, 5]

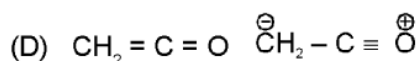
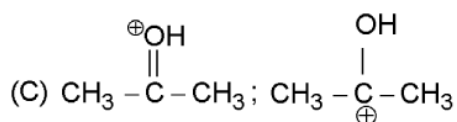
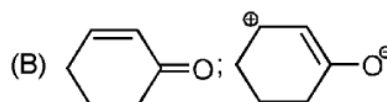
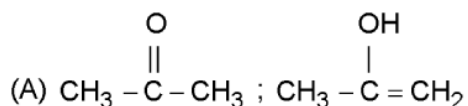
1. In which of the following species, incorrect direction of Inductive effect is/are shown ?



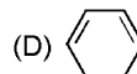
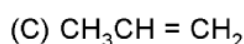
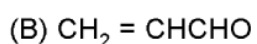
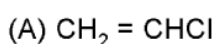
2. Resonance structures of a molecule do not have :

- (A) Identical bonding (B) Identical arrangement of atoms
 (C) The same number of paired electrons (D) Nearly the same energy content

3. Which of the following are not resonating structures of each other ?



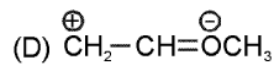
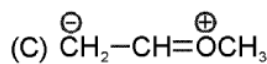
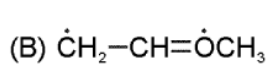
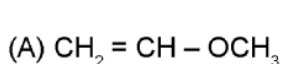
4. Which does not have conjugate system ?



5.* Which of the following statement/s is/are correct for the inductive effect ?

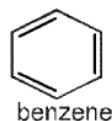
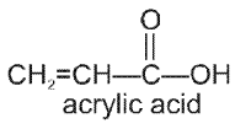
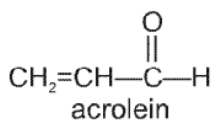
- (A) It is a permanent effect (B) It transmits through sigma electrons
 (C) It is represented by \longleftrightarrow (D) It is represented by \longrightarrow or \longleftarrow .

6.* Which of the following resonating structures are acceptable for methyl vinyl ether:



Comprehension

But-1-ene (A) and Buta-1,3-diene (B) differ not only in the number of π bonds, but (B) also has σ and π bonds at alternate positions. This type of the system is called conjugated system. Following are some of the conjugate system



In such systems, π electron shifting result into permanent polarity. This type of π -electron shift in the conjugated systems is called mesomeric effect.

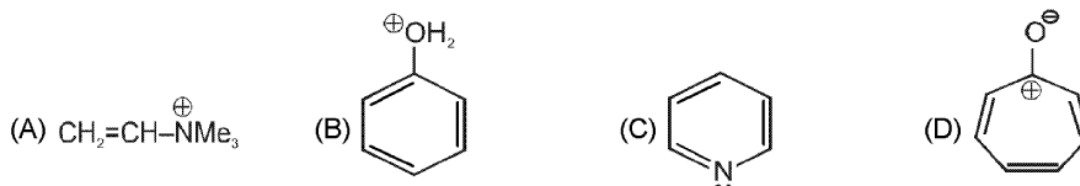
Rules for resonance forms :

- Individual resonating structures are imaginary, not real.
- Resonance forms differ only in the position of their π electrons or nonbonding electrons.
- Different resonating structures of a species don't have to be equivalent.
- Resonating structures must be valid Lewis structures and obey normal rules of valency.
- The resonance hybrid is more stable than any individual resonating structures.

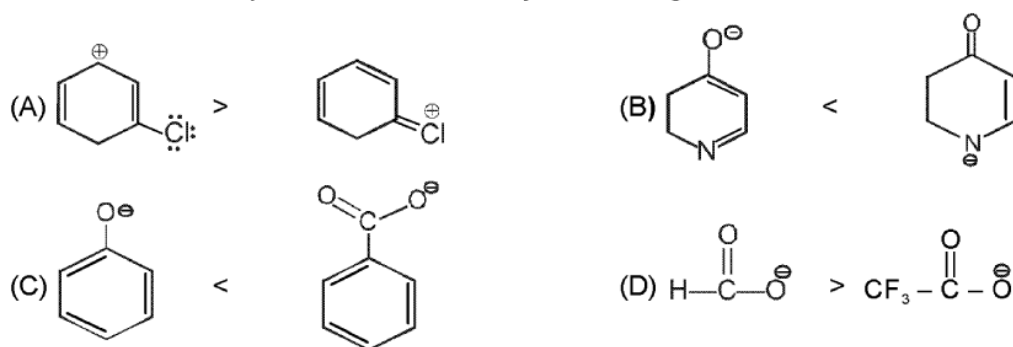
Rules for stability :

- Resonating structures with more no. of covalent bonds are more stable.
- Structures in which all of the atoms have a complete valence shell of electrons (i.e., the noble gas structure) are especially stable and make large contribution to the hybrid.
- Structure that carry negative charge on a more electronegative atom and positive charge on less electronegative atom is comparatively more stable.

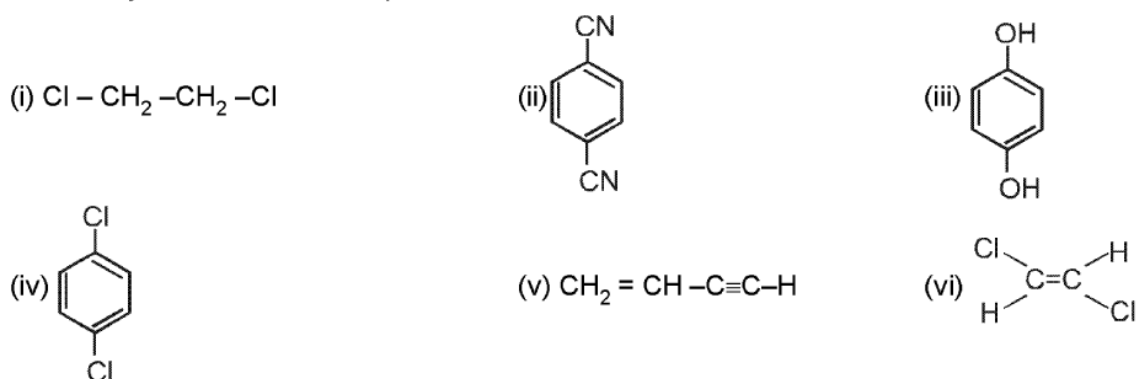
7. In which of the following compound, delocalisation is not possible



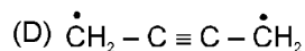
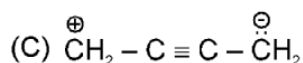
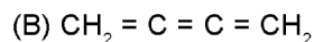
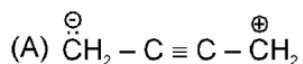
8. Select the correct option related to stability of following structure.



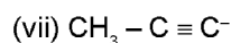
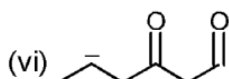
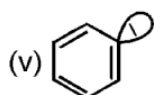
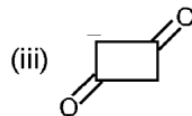
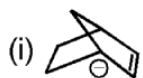
9. How many molecules are non polar.

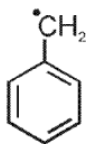


6.* Which of the following is/are acceptable resonating structures of Buta-1, 2, 3-triene.



7. In how many species the -ve charge (anion) which is not delocalized by resonance, are :



8.	Column-I	Column-II
(A)	$\overset{\oplus}{\text{C}}\text{H}_2 - \text{CH} = \text{CH}_2$	(p) Resonance possible
(B)	$\text{H}_2\text{N} - \text{CH} = \text{CH}_2$	(q) Even number of p-electrons
(C)		(r) localized lone pair of e ⁻ .
(D)	$\text{H}_2\text{N} - \overset{\text{NH}}{\underset{\parallel}{\text{C}}} - \text{NH}_2$	(s) Delocalized lone pair of e ⁻ .
		(t) 2 e ⁻ in p orbitals

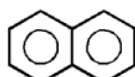
Topic : General Organic Chemistry
Type of Questions

		M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks, 3 min.)	[12, 12]
Multiple choice objective ('-1' negative marking) Q.5 to Q.6	(4 marks, 4 min.)	[8, 8]
Comprehension ('-1' negative marking) Q.7 to Q.9	(3 marks, 3 min.)	[9, 9]
Subjective Questions ('-1' negative marking) Q.10	(4 marks 5 min.)	[4, 5]

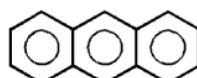
1. The correct order of resonance energy of following molecules is :



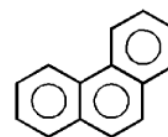
p



q



r



s

- (A) $p > q > r > s$ (B) $s > r > q > p$ (C) $r > s > q > p$ (D) $q > s > r > p$

2. Select the correct statement/s?

- (A) All canonical forms always contribute equally to the resonance hybrid.
 (B) In both ethanamine and ethenamine nitrogen is sp^3 hybridised.
 (C) All 'C-O' bond length in carbonate dianion are equal.
 (D) $CH_2=C=O$ does not exhibit resonance because it is not a conjugated system.

3. The most stable resonating structure is :

- (A) $H_2N - \overset{\oplus}{C}H - CH = CH - OCH_3$ (B) $H_2N = \overset{\oplus}{C}H - CH = CH - OCH_3$
 (C) $H_2N - CH = CH - CH = \overset{\oplus}{O}CH_3$ (D) $H_2N = \overset{\oplus}{C}H - \overset{\oplus}{C}H = \overset{\oplus}{O}CH_3$

4. Hyperconjugation phenomenon is possible in :

- (A) $CH_3 - \overset{\overset{CH_3}{|}}{C} - CH = CH_2$ (B) $CH_2 = CH_2$
 (C) $C_6H_5 - CH = CH_2$ (D) $CH_3 - CH_2 - CH = CH_2$

5.* Which of the following is/are resonating structures of diazomethane (CH_2N_2).

- (A) (B) $CH_2 = \overset{\oplus}{N} = N^-$ (C) $\overset{-}{C}H_2 - \overset{\oplus}{N} \equiv N$ (D) all of these

6.* In which case the unshared pair (lone pair) of electrons are delocalized.

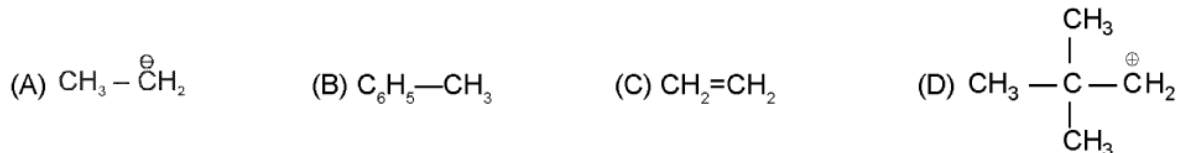
- (A) (B) $H_2C = \overset{\cdot\cdot}{N} - CH_3$ (C) $H_2C = \overset{\oplus}{N} = \overset{\ominus}{N}:$ (D) $:\overset{\ominus}{N} = \overset{\oplus}{N} = \overset{\ominus}{N}:$

Comprehension # (Q.7 to Q.9)

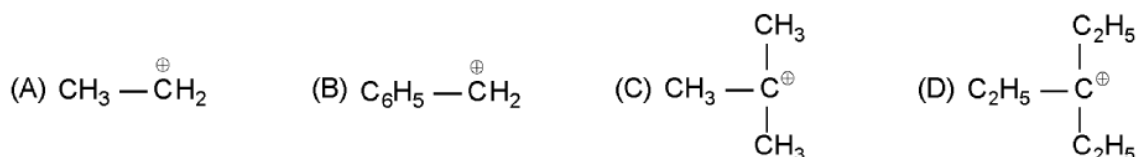
Hyperconjugation describes the orbital interactions between the π -systems and the adjacent C – H σ bond in organic compounds. Hyperconjugation is also called as Baker and Nathan effect. The necessary and sufficient conditions for the hyperconjugation are :

- (i) Compound should have at least one sp^2 -hybrid carbon of either alkene, carbocation or alkyl free radical.
 (ii) sp^3 hybridised α -carbon with respect to sp^2 -hybrid carbon should have at least one hydrogen.

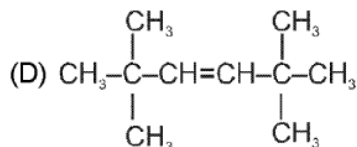
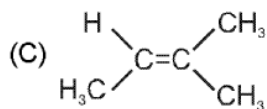
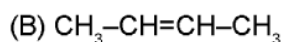
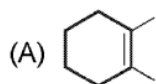
7. Hyperconjugation is possible in which of the following species ?



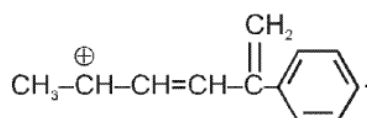
8. Which of the following carbocation will show highest number of hyperconjugation structures?



9. Which of the following alkenes will show maximum number of hyperconjugation forms ?



10. Find the total number of the position where positive charge can be delocalized by true resonance




(Excluding the given position)

Topic : General Organic Chemistry
Type of Questions

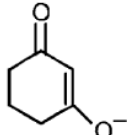
Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks, 3 min.) [12, 12]
Multiple choice objective ('-1' negative marking) Q.5 to Q.6	(4 marks, 4 min.) [8, 8]
Subjective Questions ('-1' negative marking) Q.7	(4 marks 5 min.) [4, 5]
Match the Following (no negative marking) Q.8	(8 marks, 10 min.) [8, 10]

1. Identify the correct statements

(i) All C - C bonds in  are equal.

(ii) All C - C bonds in $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$ are equal.

(iii) All C - O bonds in $\text{CH}_3 - \text{C} \begin{matrix} \text{O} \\ // \\ \text{O}^- \end{matrix}$ are equal.

(iv) All C - O bond in  are equal.

(A) i, ii, iii, iv

(B) i, iii, iv

(C) i, ii, iii

(D) ii, iii, iv

2. Among the following alkenes the order of decreasing stability is :

(I) 1-butene

(II) cis-2-butene

(III) trans-2-butene

(A) II > I > III

(B) III > I > II

(C) I > II > III

(D) III > II > I

3. Which of the following molecule has the shortest carbon-carbon single bond length ?

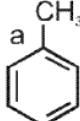
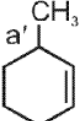
(A) $\text{CH}_2 = \text{CH} - \text{C} \equiv \text{CH}$

(B) $\text{CH}_2 = \text{CH} - \text{C} \equiv \text{N}$

(C) $\text{CH}_2 = \text{CH} - \text{CH} = \text{O}$


(D) $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$

4. The incorrect orders for bond length are :

(A)   (a' > a)

(B) $\text{CH}_3 - \overset{\text{b}}{\text{C}} - \text{NH}_2$ (b' = b)
 $\quad \quad \quad \text{b}' \parallel$
 $\quad \quad \quad \oplus \text{NH}_2$

(C) $\text{CH}_3 - \overset{\text{c}}{\text{C}} - \text{ONa}$ (c > c')
 $\quad \quad \quad \text{c}' \parallel$
 $\quad \quad \quad \text{O}$

(D)  (d > d')

5*. Which of the following statements are correct.

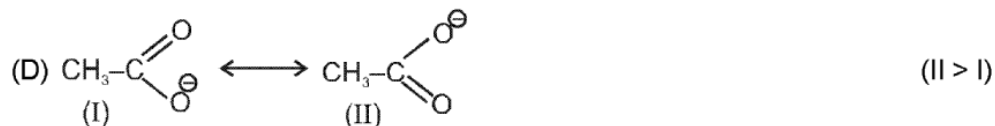
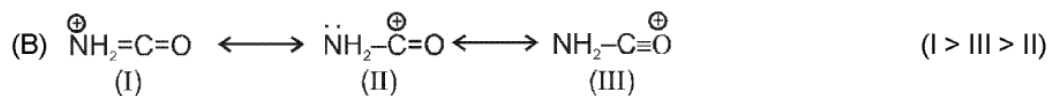
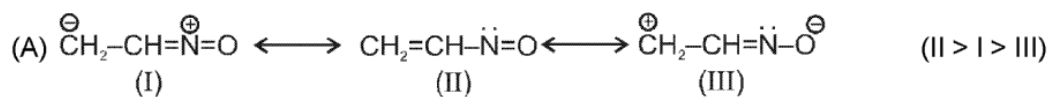
(A) I effect is permanent polarisation of sigma bond pair of electrons in the molecule.

(B) In resonating structures the hybridisation of atoms do not change.

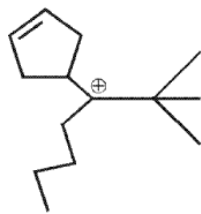
(C) In Hyperconjugative structures the hybridisation of carbon atom change.

(D) Presence of methyl group on an anion always destabilises the anion.

6*. Which of the following is/are correctly ordered for resonance stability



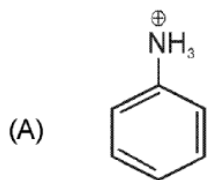
7. The total number of contributing structures showing hyperconjugation (involving C-H bonds) for the following molecule is



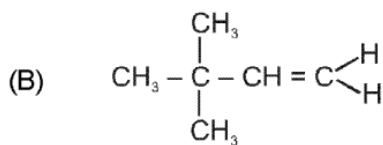
8. Match the compounds given in column I with their electronic effects mentioned in column II

Column I

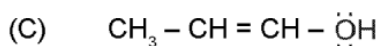
Column II



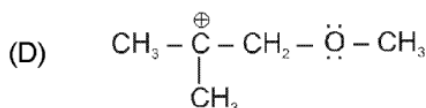
(p) Inductive effect



(q) Delocalisation of π electron



(r) Hyperconjugation



(s) Mesomeric effect

Topic : General Organic Chemistry
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.4

(3 marks, 3 min.)

M.M., Min.

[12, 12]

Multiple choice objective ('-1' negative marking) Q.5 to Q.6

(4 marks, 4 min.)

[8, 8]

Subjective Questions ('-1' negative marking) Q.7

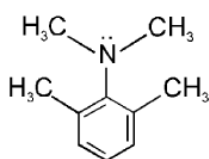
(4 marks 5 min.)

[4, 5]

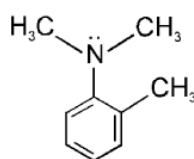
Match the Following (no negative marking) Q.8

(8 marks, 10 min.)

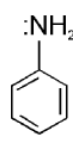
[8, 10]

 1. The benzene rings with the most and the least π -electron density respectively :


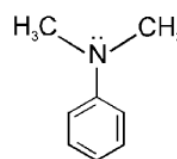
(1)



(2)



(3)



(4)

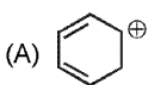
(A) 3, 1

(B) 3, 2

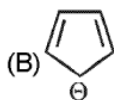
(C) 1, 2

(D) 1, 4

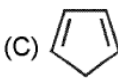
2. Identify the aromatic compound ?



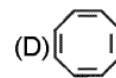
(A)



(B)

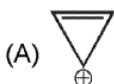


(C)

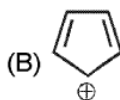


(D)

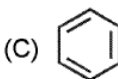
3. Among the following the anti aromatic compound is :



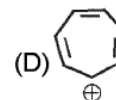
(A)



(B)

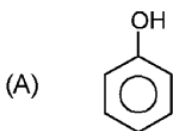


(C)

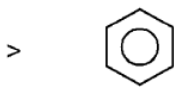


(D)

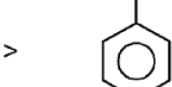
4. Which is the incorrect order of electron density in aromatic ring ?



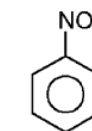
(A)



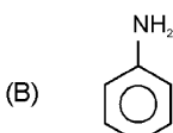
>



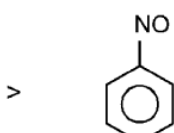
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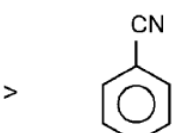
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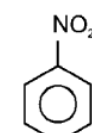
(B)



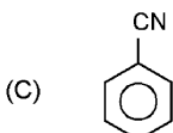
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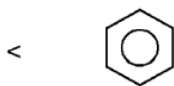
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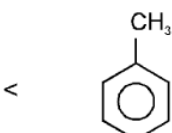
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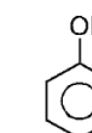
(C)



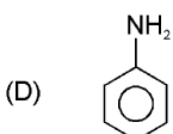
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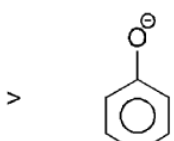
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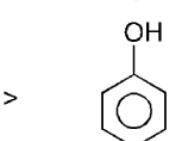
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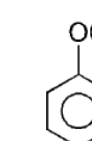
(D)



>

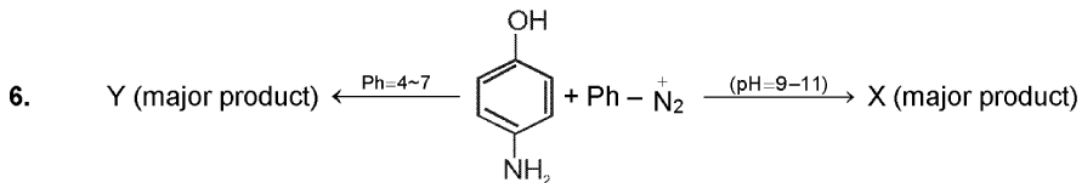


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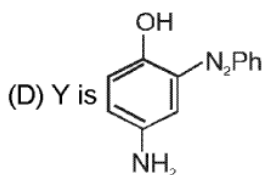
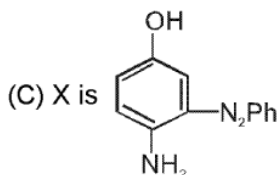
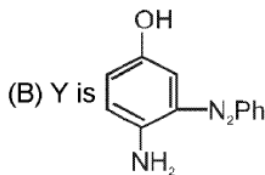
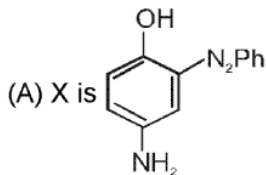


>

5. Which statement is right among these
 (A) Aromatic compound will always show resonance.
 (B) Aliphatic compound will always show resonance.
 (C) Conjugated compound will always show resonance.
 (D) Resonance is a property of both organic and inorganic molecules.



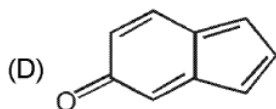
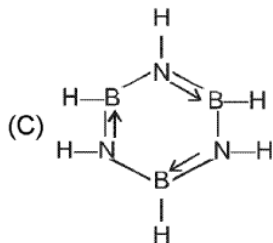
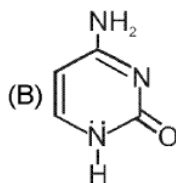
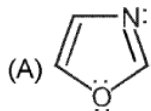
X & Y are :



7. How many equally stable resonating structures are possible for tropylium cation. (Report only those structure which are most stable).



8. Match the following
Column - I



Column - II

(p) Aromatic

(q) Non aromatic

(r) Anti aromatic

(s) Heterocyclic

Topic : General Organic Chemistry

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.5
Multiple choice objective ('-1' negative marking) Q.6 to Q.7
Subjective Questions ('-1' negative marking) Q.8
Match the Following (no negative marking) Q.9

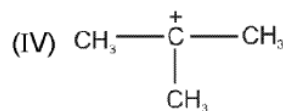
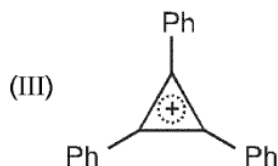
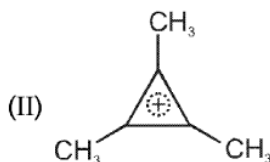
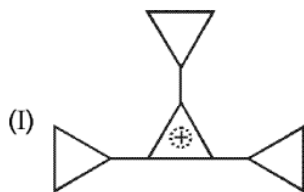
(3 marks, 3 min.)
(4 marks, 4 min.)
(4 marks 5 min.)
(8 marks, 10 min.)

M.M., Min.
[15, 15]
[8, 8]
[4, 5]
[8, 10]

1. Which carbonium ion is highly stable ?

- (A) $\text{CH}_2 = \overset{+}{\text{C}}\text{HCH}_2$ (B) $(\text{CH}_3)_3\text{C}^+$ (C) Ph_3C^+ (D) $(\text{CH}_3)_2\text{CH}^+$

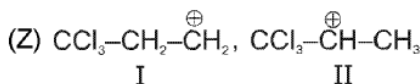
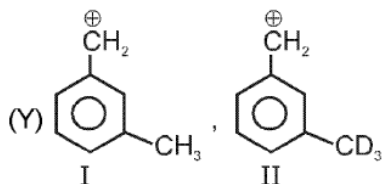
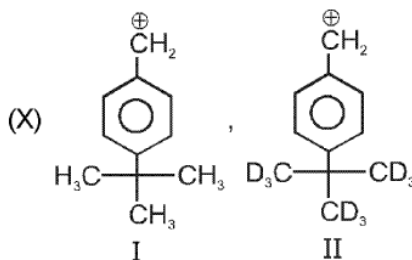
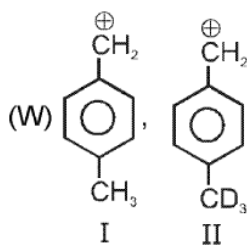
2. The correct order of stability of following carbocation is :



- (A) (III) > (II) > (I) > (IV)
(C) (I) > (III) > (IV) > (II)

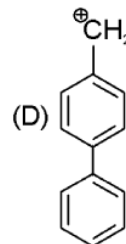
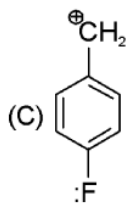
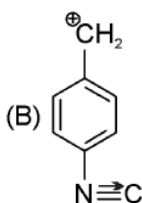
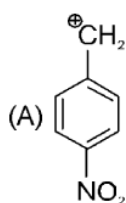
- (B) (II) > (III) > (I) > (IV)
(D) (I) > (III) > (II) > (IV)

3. Observe each pair of cations. In which case (s) first is more stable than the second :

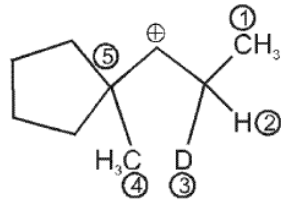


- (A) Only in W (B) Only in X and Y (C) Only in Z (D) Only in W and Z

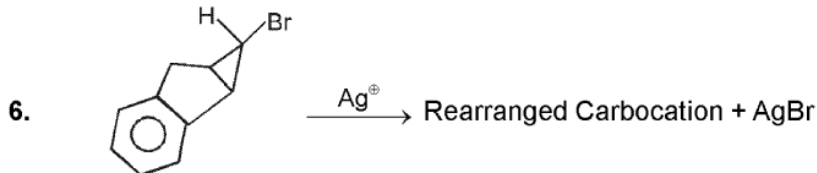
4. The most stable carbocation is :



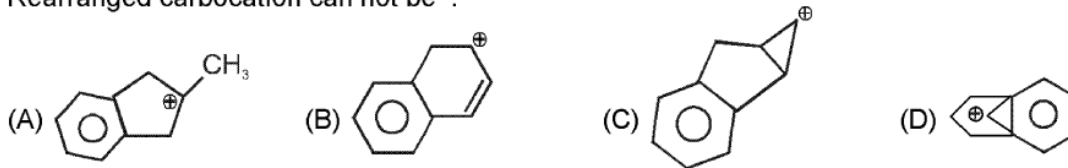
5. In the following carbocation; the most stable rearranged carbocation is formed by migration of group.



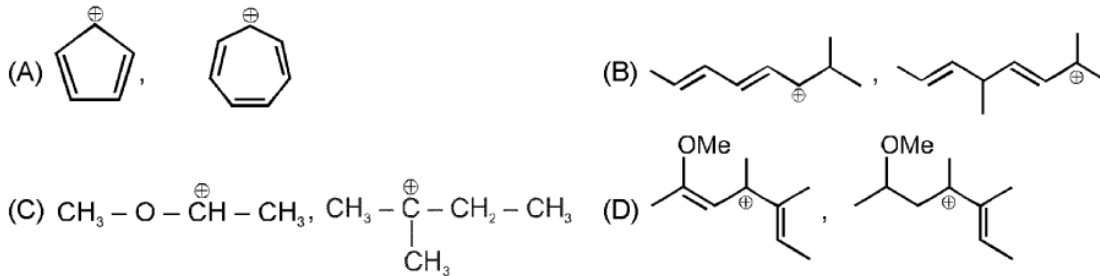
- (A) CH₃ (1) (B) CH₃ (4) (C) C—C bond (5) (D) D (3)



Rearranged carbocation can not be :



7. In which of the following first carbocation is more stable than second one ?



8. How many carbocations given below are more stable than sec. butyl carbocation

t-butyl carbocation Benzyl carbocation Allyl carbocation
Cyclopropenyl cation Tropylium cation n-butyl carbocation
cyclopropylmethyl carbocation

9. Match the carbocation (I) with the most stable rearranged carbocation (II).

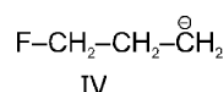
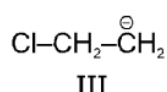
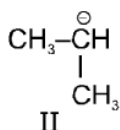
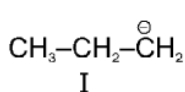
(I)	(II)
(A)	(p)
(B)	(q)
(C)	(r)
(D)	(s)

Topic : General Organic Chemistry

Type of Questions

Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks, 3 min.) [12, 12]
Multiple choice objective ('-1' negative marking) Q.5 to Q.6	(4 marks, 4 min.) [8, 8]
Subjective Questions ('-1' negative marking) Q.7	(4 marks 5 min.) [4, 5]
Match the Following (no negative marking) Q.8	(8 marks, 10 min.) [8, 10]

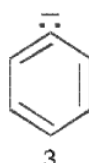
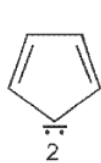
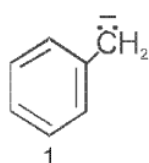
1. The correct stability order for the following is



- (A) III > IV > I > II
(C) IV > III > I > II

- (B) I > II > III > IV
(D) III > I > IV > II

2. The stability order of :



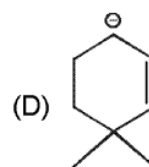
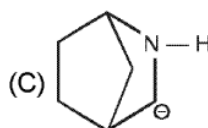
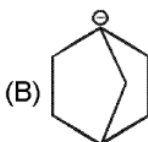
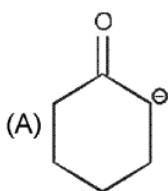
- (A) 1 > 2 > 3

- (B) 2 > 3 > 1

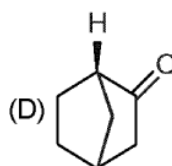
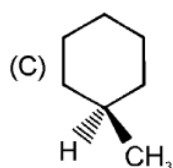
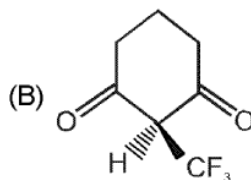
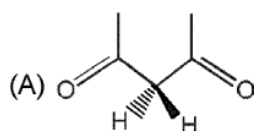
- (C) 2 > 1 > 3

- (D) 1 > 3 > 2

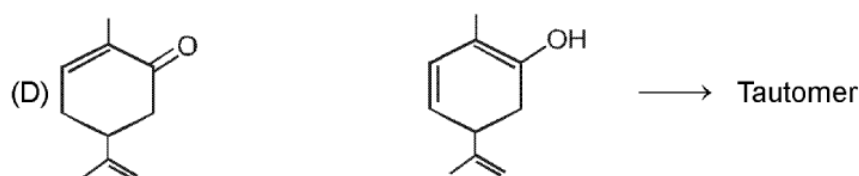
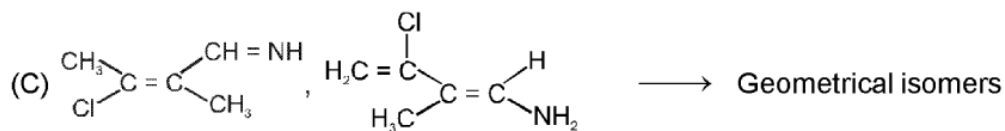
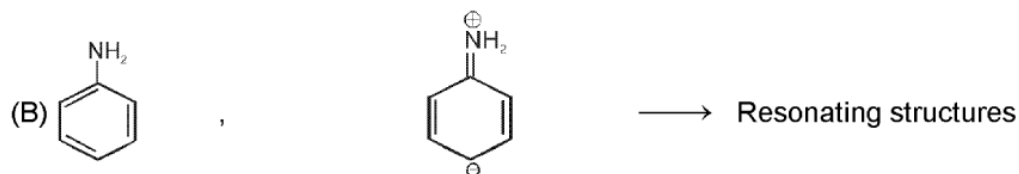
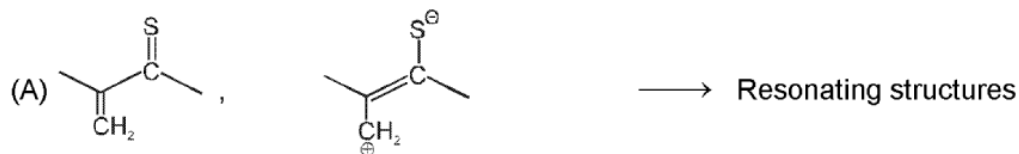
3. Which carbanion is not planer



4. Which of the following do not form planer carbanion on treatment with base.



5.* Which of the following is/are correct relation between given pairs ?

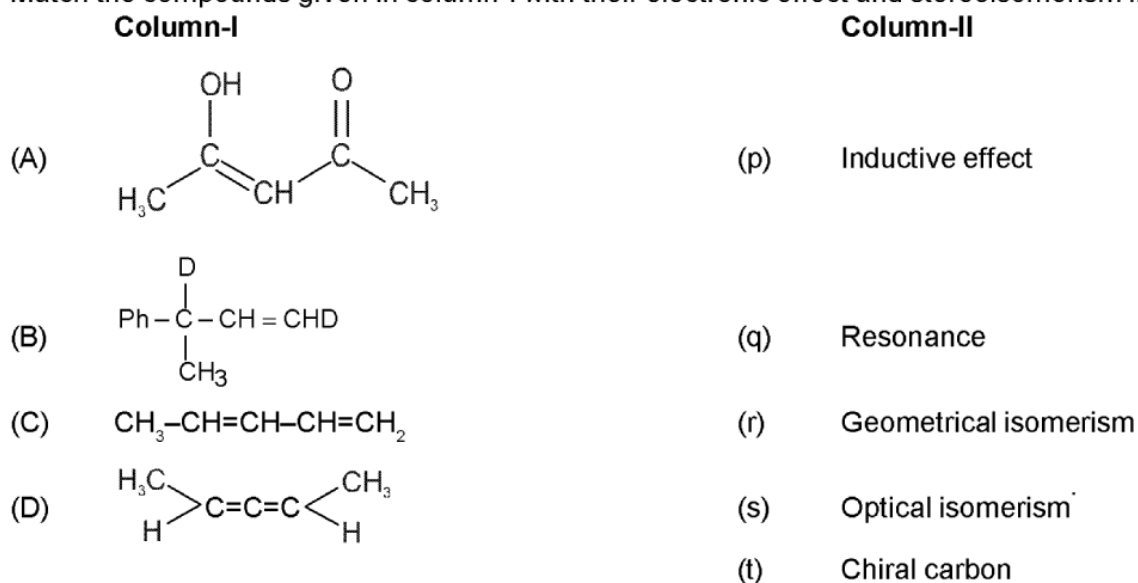


6.* In which of the following Ist is more stable than IInd :



7. How many total enolic forms (including stereoisomers) are possible for $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_3$.

8. Match the compounds given in column-I with their electronic effect and stereoisomerism in column-II.



Topic : Acid and Basic Strength

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.9

(3 marks, 3 min.)

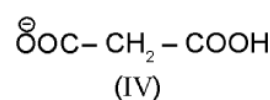
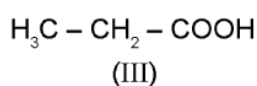
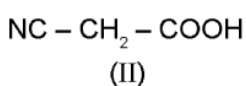
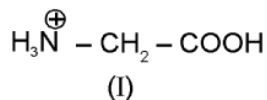
M.M., Min

[27, 27]

Match the Following (no negative marking) Q.10

(8 marks, 10 min.)

[8, 10]

1. Order of K_a of following acids is :

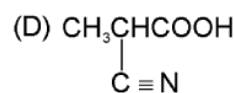
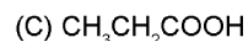
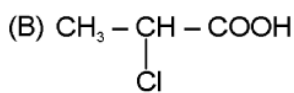
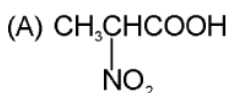
(A) I > II > III > IV

(B) II > I > III > IV

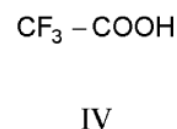
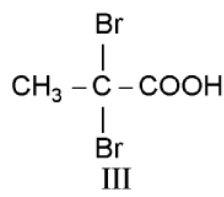
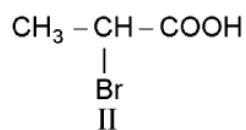
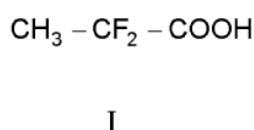
(C) I > III > II > IV

(D) IV > III > II > I

2. The strongest acid among the following compounds is :



3. The order of acidity of following acids is



(A) I > II > III > IV

(B) IV > III > II > I

(C) IV > I > III > II

(D) IV > III > I > II

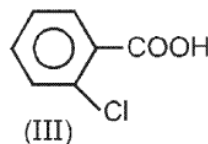
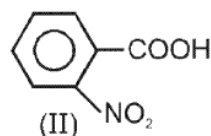
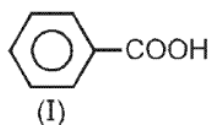
4. Which one of the following carboxylic acid is the strongest :

(A) o-methyl benzoic acid

(B) m-methyl benzoic acid

(C) p-methyl benzoic acid

(D) Benzoic acid

5. Increasing value of dissociation constant K_a of the following is :

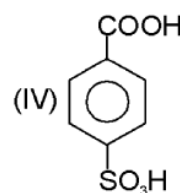
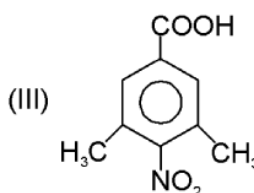
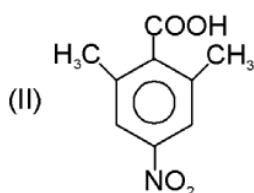
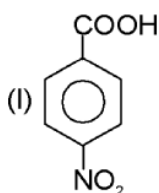
(A) I < II < III

(B) II < III < I

(C) III < II < I

(D) I < III < II

6. The correct decreasing order of acid strength of following compounds is :



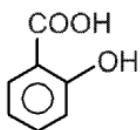
(A) IV > I > II > III

(B) II > IV > III > I

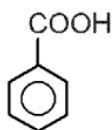
(C) I > IV > II > III

(D) IV > II > I > III

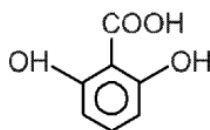
7. The correct decreasing order of acid strength of following compounds is :



(A) I > II > III



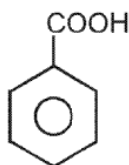
(B) II > III > I



(C) III > II > I

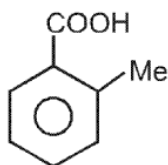
(D) III > I > II

8.



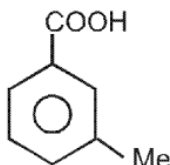
(I)

Pka. 4.17



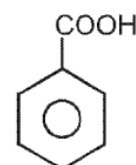
(II)

Pka. 3.91



(III)

Pka. 4.27



(IV)

Pka. 4.37

Mark True and False statements related to the variation of pKa values given for the compounds mentioned above.

S₁ : Me is electron releasing group but (II) is more acidic than (I) due to SIR.

S₂ : (IV) is weaker acid than (III) due to + hyperconjugation effect in (IV).

S₃ : Only +I effect of Me is observed in (III).

S₄ : The conjugate base of (IV) is less stable than that of (I).

(A) TTTT

(B) TFTF

(C) FTFT

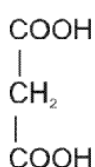
(D) FFTT

9.



I

K_{a1} = 5400 × 10⁻⁵



II

K_{a1} = 140 × 10⁻⁵

The reason for higher K_{a1} value of oxalic acid (I) as compared to that of malonic acid (II) is :

(A) The anion formed after the removal of first H⁺ of oxalic acid (I) is more stable due to stronger -I effect of -COOH present at close distance

(B) The anion formed after the removal of first H⁺ of oxalic acid (I) is less stable due to +I effect of -COOH group.

(C) The anion formed on removal of first H⁺ of malonic acid is more stable than that of oxalic acid due to -M effect of other -COOH group.

(D) Oxalic acid is more acidic than malonic acid due to its lesser molecular weight.

10. Match the acids with their K_a values.

Column-I (Acids)

(A) Benzoic acid

(B) p-Toluic acid

(C) p-methoxy benzoic acid

(D) p-chlorobenzoic acid

Column-II (K_a values)

(p) 10.3 × 10⁻⁵

(q) 3.3 × 10⁻⁵

(r) 6.4 × 10⁻⁵

(s) 4.2 × 10⁻⁵

Topic : Acid and Basic Strength
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks, 3 min.)

M.M., Min.

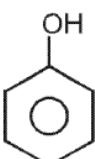
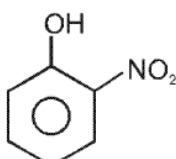
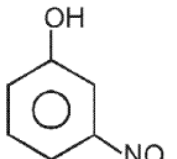
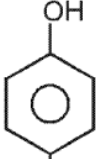
[18, 18]

Subjective Questions ('-1' negative marking) Q.7 to Q.8

(4 marks, 5 min.)

[8, 10]

1.

			
I	II	III	IV
Pka. 9.98	7.23	8.40	7.15

Mark True and False statements related to the variation in pKa values given for the compounds mentioned above

 S_1 : III is more acidic than I due to -I effect of $-\text{NO}_2$ group

 S_2 : Due to H-bonding in II, it is slightly less acidic than IV.

 S_3 : Due to presences of -M effect II & IV are more acidic than that of III.

 S_4 : Mesomeric effect of $-\text{NO}_2$ group is not operative in casei of III

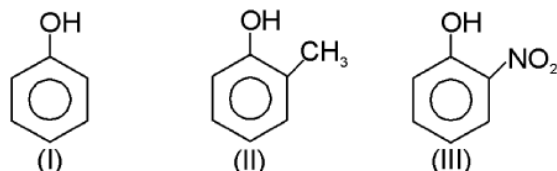
(A) TTTT

(B) TFTF

(C) FTFT

(D) FFTT

2. The correct decreasing order of acid strength of following compounds is :



(A) III > II > I

(B) I > II > III

(C) II > III > I

(D) III > I > II

3. Arrange basicity of the given compounds in decreasing order :

(i) $\text{CH}_3-\text{CH}_2-\text{NH}_2$ (ii) $\text{CH}_2=\text{CH}-\text{NH}_2$ (iii) $\text{CH}\equiv\text{C}-\text{NH}_2$

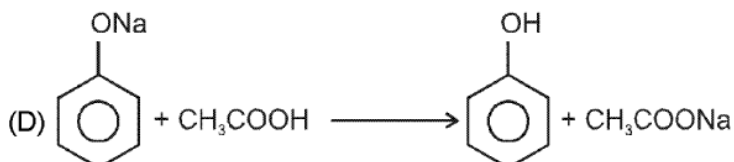
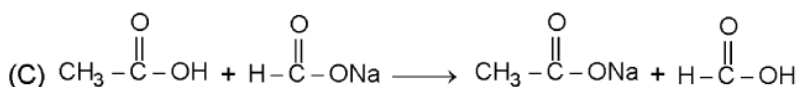
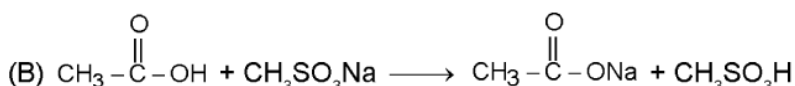
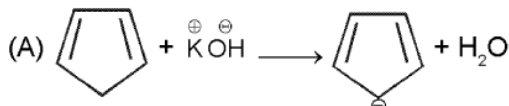
(A) i > ii > iii

(B) i > iii > ii

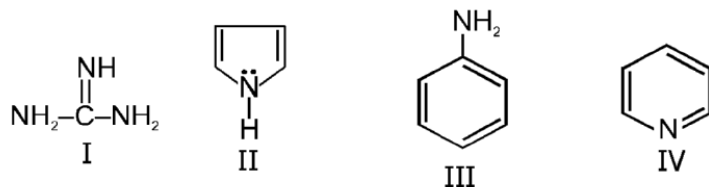
(C) iii > ii > i

(D) ii > iii > i

4. Which of the following reaction is possible ?

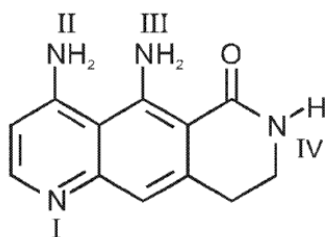


5. Write the basicity order of the following compounds?



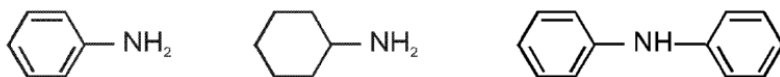
- (A) I > III > IV > II (B) I > II > III > IV (C) I > IV > III > II (D) I > III > II > IV

6. Identify the most basic nitrogen atom.

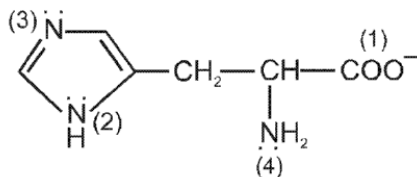


- (A) I (B) II (C) III (D) IV

7. Write the basicity order of the following compounds ?



8. Which of the following group is most basic :



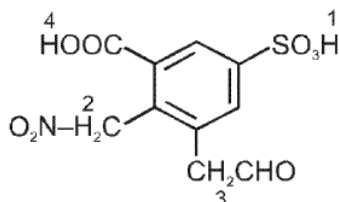
Topic : Acid and Basic Strength
Type of Questions

		M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks, 3 min.)	[12, 12]
Comprehension ('-1' negative marking) Q.5 to Q.6	(3 marks, 3 min.)	[6, 6]
True or False (no negative marking) Q.7 & Q.8	(2 marks, 2 min.)	[4, 4]
Short Subjective Questions ('-1' negative marking) Q.9 to Q.11	(3 marks, 3 min.)	[9, 9]

1. Which order of acidic strength is incorrect

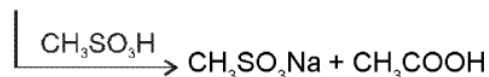
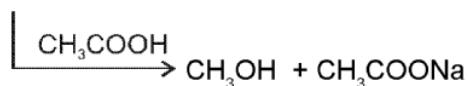
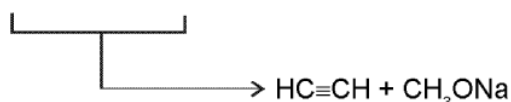
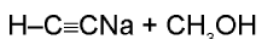
- (A) $\text{CF}_3\text{COOH} > \text{CCl}_3\text{COOH} > \text{CHCl}_2\text{COOH} > \text{NO}_2\text{CH}_2\text{COOH} > \text{N} \equiv \text{C} - \text{CH}_2\text{COOH} > \text{F} - \text{CH}_2\text{COOH}$
 (B) $\text{F} - \text{CH}_2\text{COOH} > \text{Cl} - \text{CH}_2\text{COOH} > \text{BrCH}_2\text{COOH} > \text{HCOOH} > \text{Cl} - \text{CH}_2\text{CH}_2\text{COOH} > \text{C}_6\text{H}_5\text{COOH}$
 (C) $\text{C}_6\text{H}_5\text{COOH} > \text{C}_6\text{H}_5\text{CH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{CH}_3\text{CH}_2\text{COOH}$
 (D) $\text{CH}_2 = \text{CH} - \text{COOH} < \text{CH}_3 - \text{CH}_2 - \text{COOH}$

2. The correct order of ease of deprotonation of labelled H-atoms is :



- (A) $1 > 3 > 2 > 4$ (B) $1 > 2 > 3 > 4$
 (C) $1 > 4 > 2 > 3$ (D) $1 > 3 > 4 > 2$

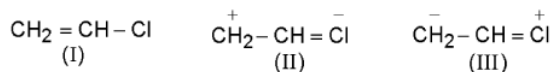
3. Observe the following reaction sequence.



The acidity order will be

- (A) $\text{HC} \equiv \text{CH} > \text{CH}_3\text{OH} > \text{CH}_3\text{COOH} > \text{CH}_3\text{SO}_3\text{H}$. (B) $\text{CH}_3\text{SO}_3\text{H} > \text{CH}_3\text{COOH} > \text{CH}_3\text{OH} > \text{HC} \equiv \text{CH}$.
 (C) $\text{CH}_3\text{COOH} > \text{CH}_3\text{SO}_3\text{H} > \text{CH}_3\text{OH} > \text{HC} \equiv \text{CH}$. (D) $\text{CH}_3\text{SO}_3\text{H} > \text{CH}_3\text{COOH} > \text{HC} \equiv \text{CH} > \text{CH}_3\text{OH}$.

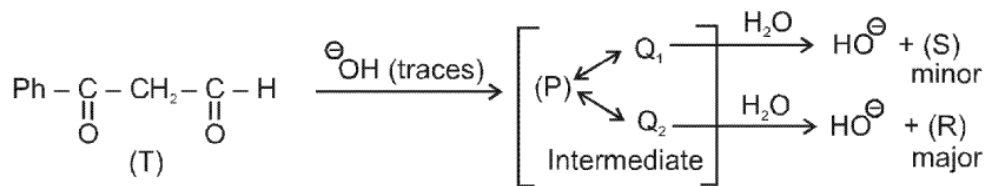
4. Give correct order of relative stabilities of following resonating structures :



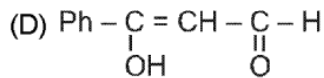
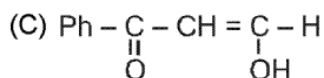
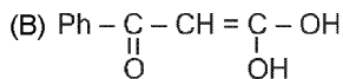
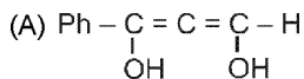
- (A) $\text{I} > \text{II} > \text{III}$ (B) $\text{I} > \text{III} > \text{II}$
 (C) $\text{III} > \text{II} > \text{I}$ (D) $\text{II} > \text{I} > \text{III}$

Comprehension

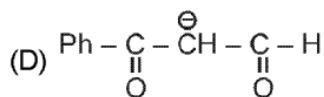
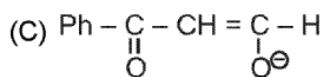
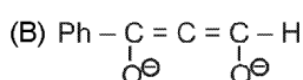
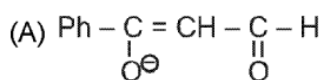
Observe the following reaction and answer the following questions



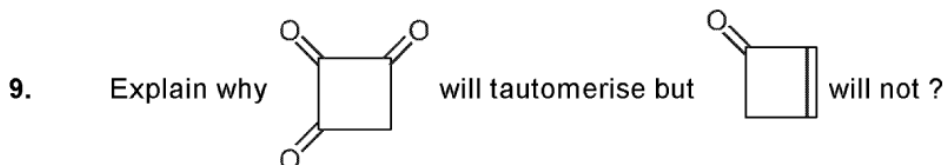
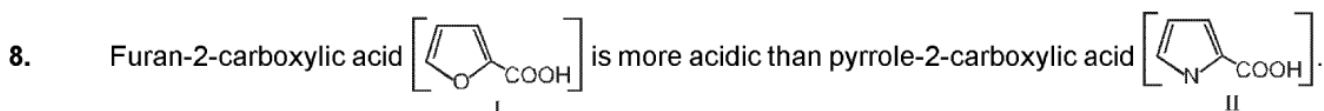
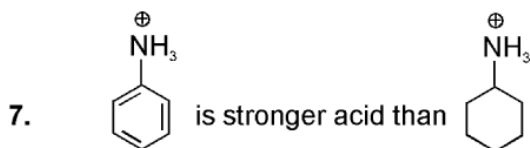
5. The product 'R' is



6. The structure of Q₁ is



True/ False :



10. Cis and trans-4-tert-butyl-2-methyl cyclohexanone are interconverted by base treatment. Explain why?

11. Compound 'X' is acyclic and shows keto enol tautomerism (significant enol content). It is least molecular weight sweet smelling chiral compound with one 'D' atom which shows positive 2,4-DNP & neutral FeCl₃ test. Calculate its molecular weight.

Topic : Acid and Basic Strength

Type of Questions

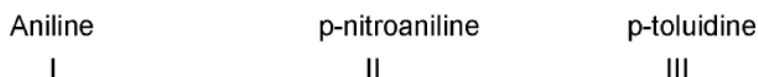
Single choice Objective ('-1' negative marking) Q.1 to Q.6	(3 marks, 3 min.)	M.M., Min. [18, 18]
Fill in the Blanks ('-1' negative marking) Q.7	(3 marks, 3 min.)	[3, 3]
True or False (no negative marking) Q.8	(2 marks, 2 min.)	[2, 2]

1. Decreasing order of their basic strength follows for :



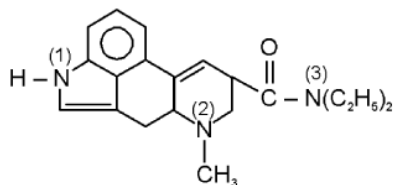
(A) $V > I > III > IV > II$ (B) $I > V > III > IV > II$ (C) $I > V > IV > III > II$ (D) $V > I > IV > III > II$

2. Increasing order of their basic strength follows for :



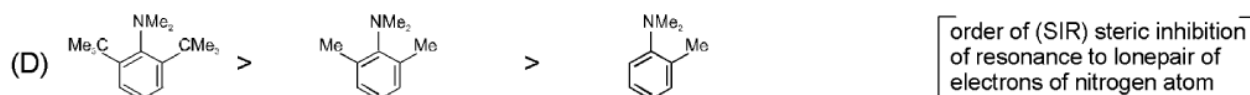
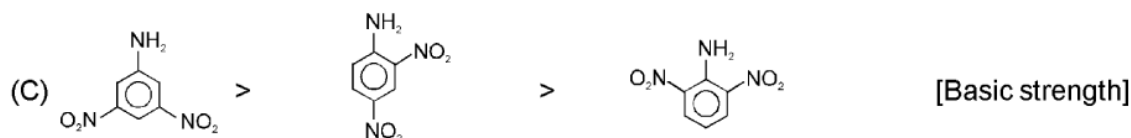
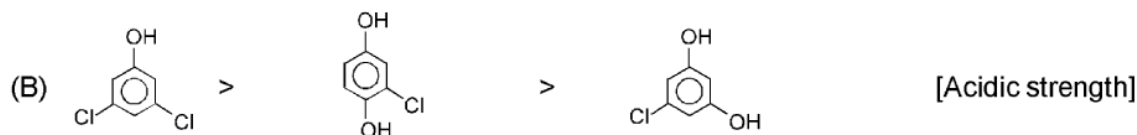
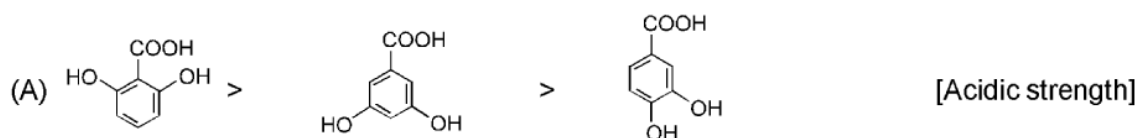
(A) $III < I < II$ (B) $III < II < I$ (C) $II < I < III$ (D) $I < III < II$

3. Which nitrogen in LSD (Lysergic acid diethylamide) is most basic ?

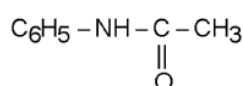
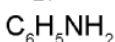
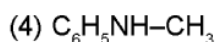
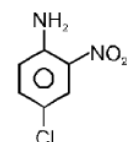
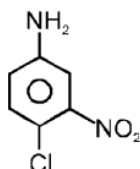
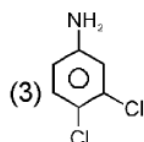
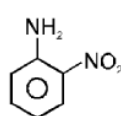
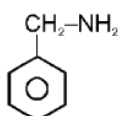
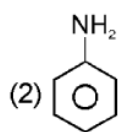
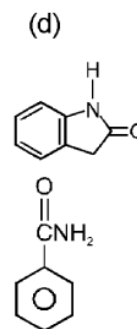
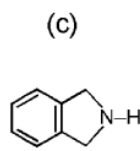
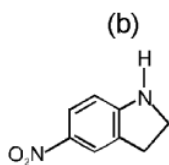
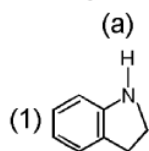


(A) 1 (B) 2 (C) 3 (D) all are equally basic

4. Which of the following is incorrect order for the property mentioned against each groups



5. Identify strongest & weakest base in each.



- (1) (2) (3) (4)
(A) c, d b, d a, c a, c
(C) c, b b, d a, c b, d

- (1) (2) (3) (4)
(B) c, d b, c a, b a, c
(D) a, b b, c a, c b, c

6. Which is incorrect statement

(A) Imidazole is more basic than pyridine because conjugate acid of imidazole have equal distribution of charge between both nitrogen.

(B) is stronger acid than H_2O .

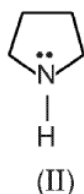
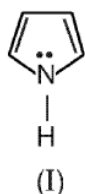
(C) A solution of imidazole in water is basic than pure water.

(D) CH_3NH_2 is more basic than imidazole.

7. Explain why is more basic than .

True/False

8. (a) Pyrrolidine (II) is more basic than pyrrole (I).



(b) C-N bond length in is more than C-N bond length in .

(c) 2, 4, 6 trinitro N, N-dimethylaniline is more basic than 2, 4, 6 - trinitroaniline.

Topic : Reduction, Oxidation & Hydrolysis of Organic Compounds
Type of Questions

Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.6	(3 marks, 3 min.) [18, 18]
Multiple choice objective ('-1' negative marking) Q.7	(4 marks, 4 min.) [4, 4]
Subjective Questions ('-1' negative marking) Q.8	(4 marks, 5 min.) [4, 5]

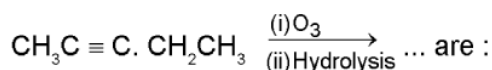
1. Ozonolysis of a hydrocarbon gives one mole of acetone and one mole of formaldehyde. The hydrocarbon is

- (A) Propene (B) 2-Methylpropene
 (C) 2-Methyl-2-butene (D) 2-Methyl-1-butene

2. An alkene with molecular formula C_8H_{16} on oxidation with hot $KMnO_4$ gives acetone and 3-pentanone. The structure of the alkene is

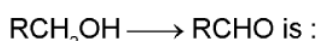
- (A) $(CH_3)_2C=C(C_2H_5)_2$ (B) 
 (C) $(C_2H_5)_2C=CHCH_2CH_3$ (D) $(CH_3)_2C=CH(CH_2)_3CH_3$

3. Products of the following reaction



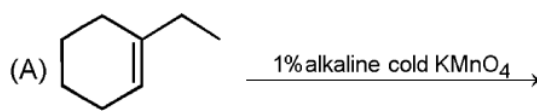
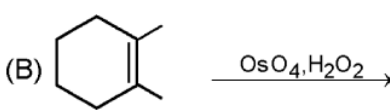
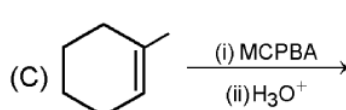
- (A) $CH_3CHO + CH_3CH_2CHO$ (B) $CH_3COOH + CH_3COCH_3$
 (C) $CH_3COOH + HOOC \cdot CH_2CH_3$ (D) $CH_3COOH + CO_2$

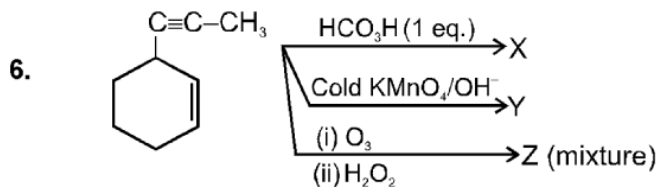
4. The most suitable reagent for the conversion of :



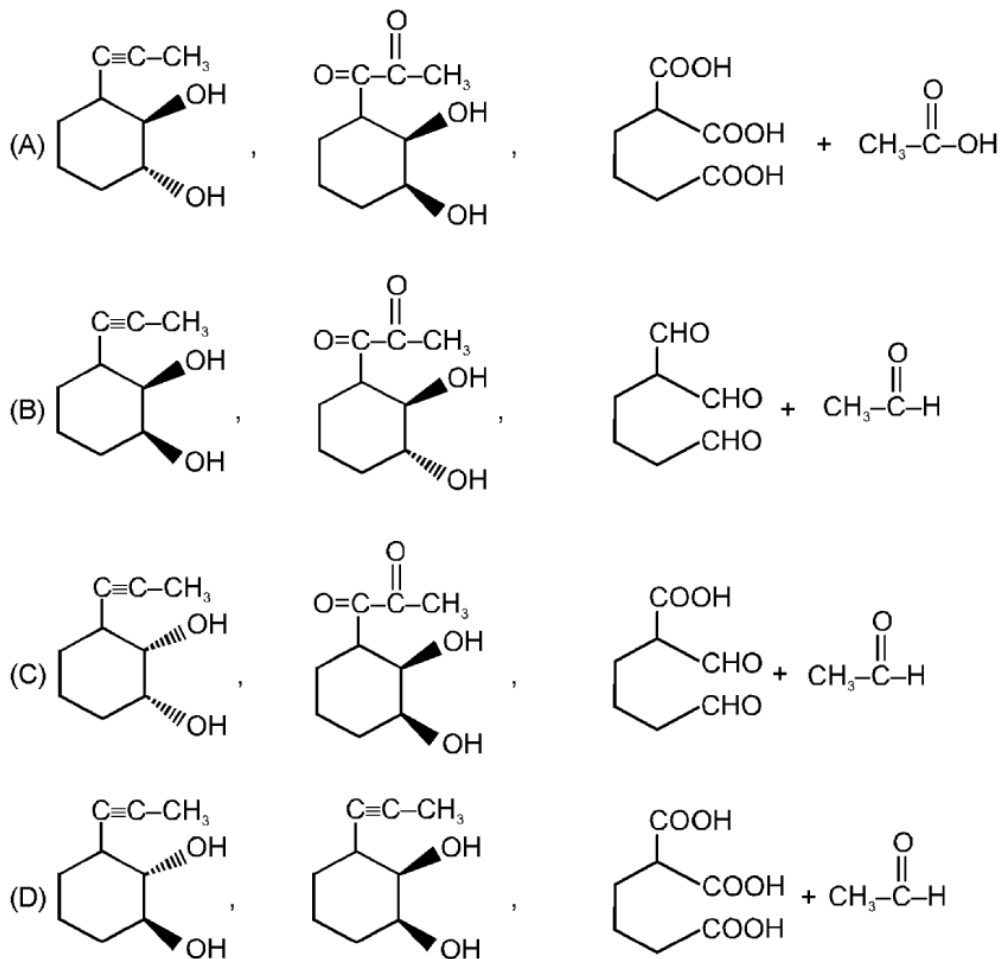
- (A) $KMnO_4$ (B) $K_2Cr_2O_7$
 (C) CrO_3 (D) PCC (pyridine chloro chromate)

5. Which reaction gives the non-resolvable product :

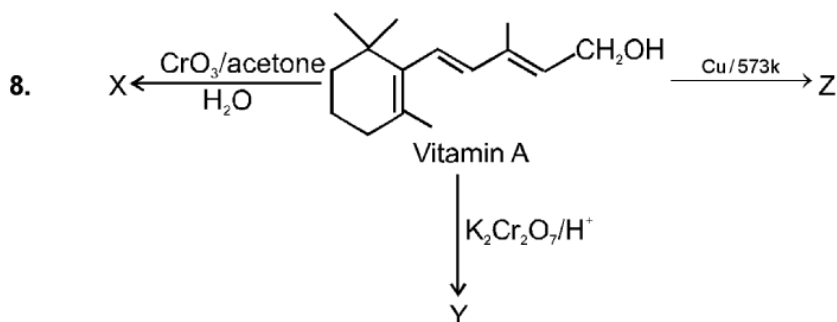
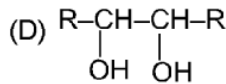
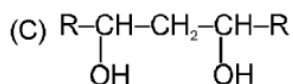
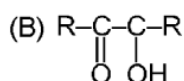
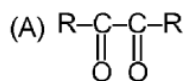
- (A)  (B) 
 (C)  (D) None of these



X, Y & Z are respectively



7.* Which of the following will be oxidised by HIO_4



Identify the products.

Topic : Hydrocarbons
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.8

(3 marks, 3 min.)

M.M., Min.

Subjective Questions ('-1' negative marking) Q.9

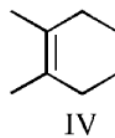
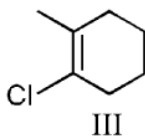
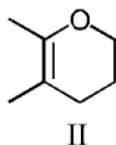
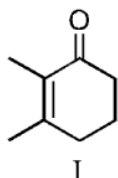
(4 marks, 5 min.)

[24, 24]

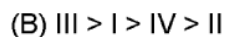
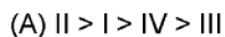
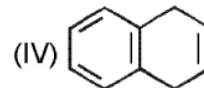
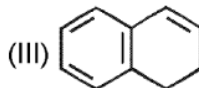
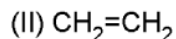
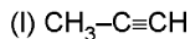
[4, 5]

1. The correct order of alkene reactivity towards an electrophile is mentioned in-
- (A) $\text{CH}_2=\text{CH}-\text{Cl} > \text{CH}_2=\text{CH}-\text{OCH}_3$ (B) $\text{CH}_2=\text{CHCl} < \text{CH}_2=\text{CCl}_2$
 (C) ethene > propene (D) $\text{CH}_2 = \text{CH} - \text{OCH}_3 > \text{CH}_2=\text{CH}-\underset{\text{OH}}{\text{CH}_2}$

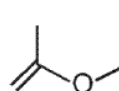
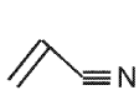
2. The correct relative rate of reaction of the given alkenes for any given electrophiles is



- (A) I > II > IV > III (B) II > IV > III > I (C) II > III > IV > I (D) IV > I > III > II
3. The correct order of reactivity towards electrophilic addition reaction :



4. The correct order of HOCl/H^+ addition reaction with the following is :

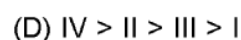
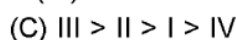
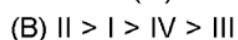
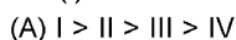


(I)

(II)

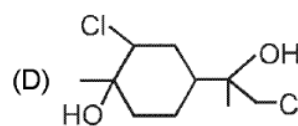
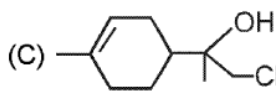
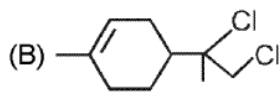
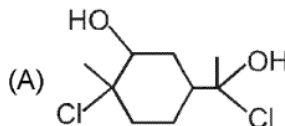
(III)

(IV)



5. $\xrightarrow[\text{(excess)}]{\text{Cl}_2/\text{H}_2\text{O}}$ 'X',

Compound 'X' will be :



6. Which of the following statements is correct ?

(A) Alkynes are more reactive than alkenes towards halogen addition.

(B) Alkenes are more reactive than alkynes towards halogen addition

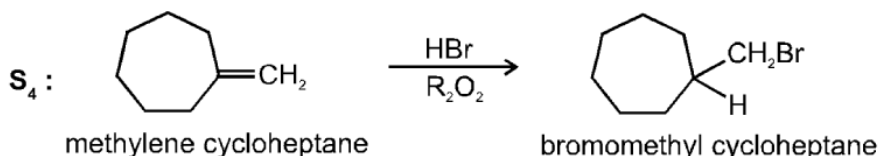
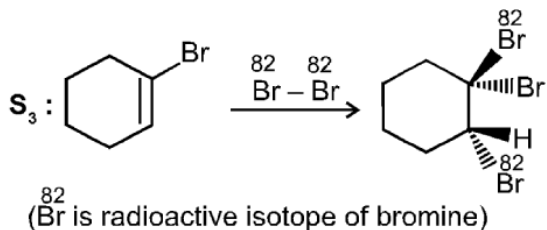
(C) Both alkynes and alkenes are equally reactive towards halogen addition

(D) Primary vinylic cation $\text{RCH}=\overset{\oplus}{\text{C}}\text{H}$ is less reactive than secondary vinylic cation $\text{RC}=\overset{\oplus}{\text{C}}\text{H}_2$

7. Mention True (T) and false (F) out of the following statements :

S_1 : In hydroboration oxidation of alkene, H and OH are introduced with a regioselectivity opposite to that of Markownikov's rule.

S_2 : Electrophilic addition of HCl to 2-methyl propene is reverse of E^1 elimination reaction of tert-butyl chloride.



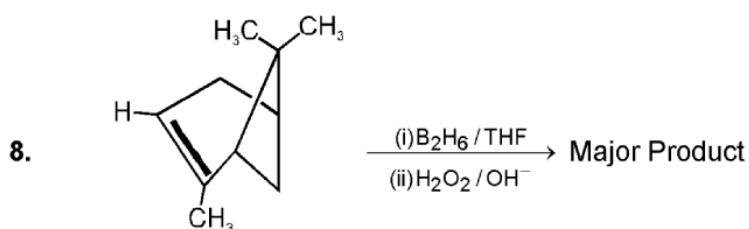
Codes :

(A) T T T T

(B) T T T F

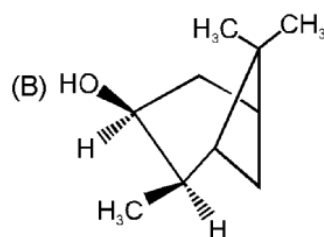
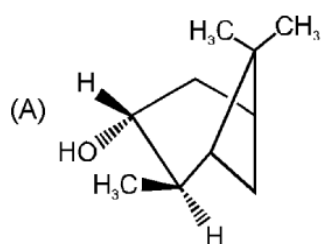
(C) T F T F

(D) F T F T



α - pinene

The products P and Q are respectively -



(C) A & B both

(D) None of these

9. An unsaturated organic compound (A) of molecular formula $\text{C}_9\text{H}_9\text{Cl}$ decolourise $\text{Br}_2/\text{H}_2\text{O}$ and produces another unsaturated compound (B) of molecular formula C_9H_8 in treating with sodamide in liquid ammonia. (B) on hydration using $\text{Hg}^{++}/\text{H}_2\text{SO}_4$ gives (C) which on vigorous oxidation produces an aromatic dibasic acid (D) giving only one mono nitroproduct. An isomer (E) of (B) on oxidation gives a monobasic acid of molecular mass 122.

Topic : Hydrocarbons
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.7

(3 marks, 3 min.)

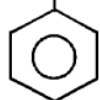
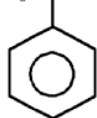
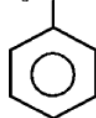
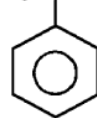
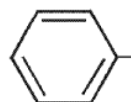
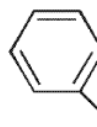
M.M., Min.

True or False (no negative marking) Q.8

(2 marks, 2 min.)

[21, 21]

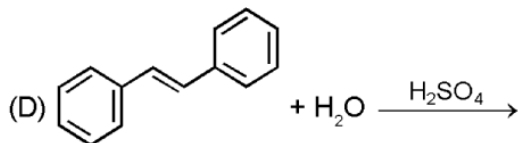
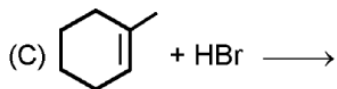
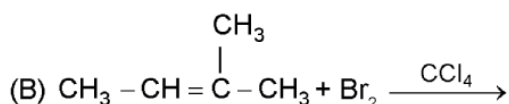
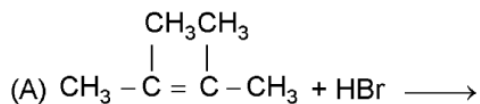
[2, 2]

 1. $\text{CH}_3\text{-CH}(\text{C}_6\text{H}_5)\text{-CH=CH}_2 \xrightarrow{\text{H}_3\text{O}^+}$ P (major), P is :
(A) $\text{CH}_3\text{-CH}(\text{C}_6\text{H}_5)\text{-CH}_2\text{-CH}_2\text{-OH}$ (B) $\text{CH}_3\text{-CH}(\text{C}_6\text{H}_5)\text{-CH}(\text{OH})\text{-CH}_3$ (C) $\text{CH}_3\text{-C}(\text{OH})(\text{C}_6\text{H}_5)\text{-CH}_2\text{-CH}_3$ (D) $\text{CH}_3\text{-CH}(\text{OH})\text{-CH}_2\text{-CH}_2\text{-C}_6\text{H}_5$
 2. $\text{C}_6\text{H}_5\text{-CH=CH-CH}_3 \xrightarrow{\text{H}_2\text{O}/\text{H}^+}$ P (major), P is :
(A) $\text{C}_6\text{H}_5\text{-CH}_2\text{-CH}(\text{OH})\text{-CH}_3$ (B) $\text{C}_6\text{H}_5\text{-CH}(\text{OH})\text{-CH}_2\text{CH}_3$ (C) $\text{C}_6\text{H}_5\text{-CH=CH-CH}_3$ (D) $\text{HO-C}_6\text{H}_4\text{-CH=CH-CH}_3$ 

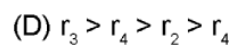
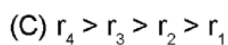
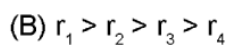
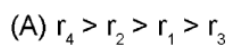
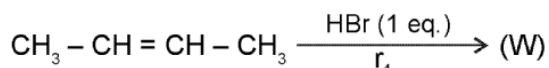
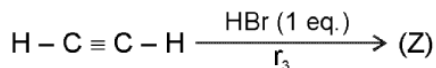
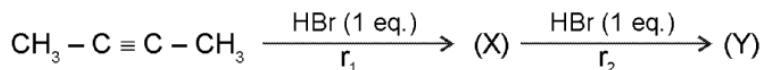
3. which of the following alkene will give (P) on oxymercuration reduction reaction, (P) =

(A) CH=CH_2 (B) CH_3 (C) CH_3 (D) CH_3

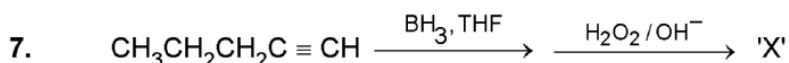
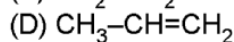
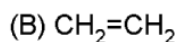
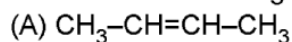
4. In which of the following reactions markovnikov rule of addition reaction is followed



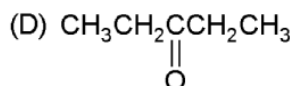
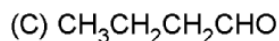
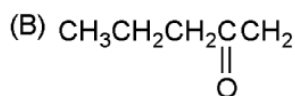
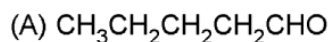
5. The correct order of rate of following reactions is



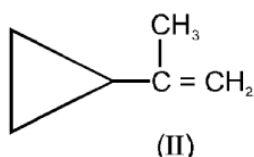
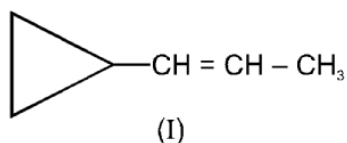
6. Which of the following shows least reactivity towards bromination ?



Identify the product 'X' :



8. The rate of acid catalysed hydration of II is much faster than that of I.



Topic : Hydrocarbons
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.3

Multiple choice objective ('-1' negative marking) Q.4

Comprehension ('-1' negative marking) Q.5 to Q.7

True or False (no negative marking) Q.8

Subjective Questions ('-1' negative marking) Q.9

(3 marks, 3 min.)

(4 marks, 4 min.)

(3 marks, 3 min.)

(2 marks, 2 min.)

(4 marks, 5 min.)

M.M., Min.

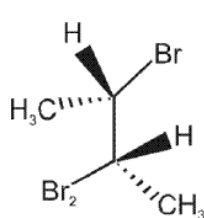
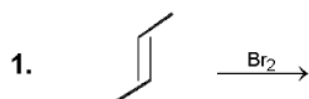
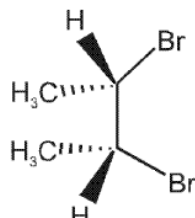
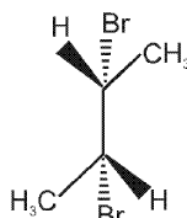
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[4, 4]

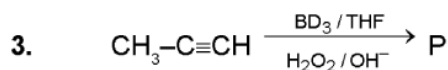
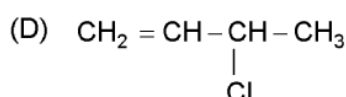
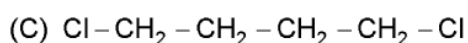
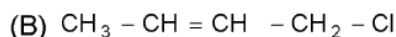
[9, 9]

[2, 2]

[4, 5]

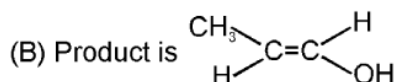

 (I)
 (A) I and III

 (II)
 (B) II and III

 (III)
 (C) I only
 (D) II only

2. When 1, 3-butadiene is warmed with one mole of HCl gives many product, choose the correct major product among them.



incorrect about product p

(A) It has two stereoisomer



(C) Cyclic T.S Formed

(D) stereospecific syn addition

4.* Which among the following reagents gives syn. addition with alkenes :

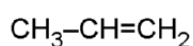
(A) Br_2 (B) $\text{dil. KMnO}_4 / \text{OH}^-$ (C) $\text{OsO}_4 / \text{NaSO}_3\text{H} / \text{HOH}$ (D) $\text{RCO}_3\text{H} / \text{H}_3\text{O}^+$

Comprehension # (5 to 7)

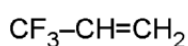
The alkenes which form more stable carbocation intermediate are more reactive towards addition of H_2O in presence of dil. H_2SO_4 .

5. The correct order of reactivity of following alkenes is :
 (1) Ethene (2) Propenoic acid (3) Butenedioic acid
 (A) $3 > 2 > 1$ (B) $2 > 1 > 3$ (C) $1 > 2 > 3$ (D) $1 > 3 > 2$
6. The correct order of alkene reactivity is mentioned in-
 (A) $CH_2=CH-Cl > CH_2=CH-OCH_3$ (B) $CH_2=CHCl < CH_2=CCl_2$
 (C) ethene > propene (D) $CH_2=CH-OCH_3 > CH_2=CH-\underset{\substack{| \\ OH}}{CH_2}$

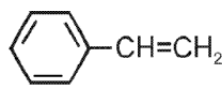
7. Observe the following compounds



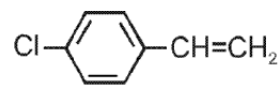
(1)



(2)



(3)

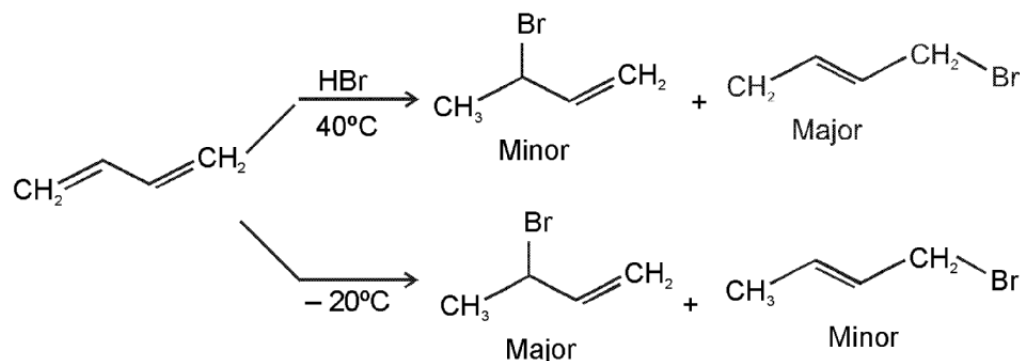


(4)

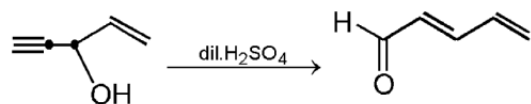
The **incorrect** order of reactivity is

- (A) $1 > 2$ (B) $3 > 1$ (C) $4 > 2$ (D) $4 > 3$

8. Mention if the following reaction sequence is true or false :



- 9.



Give the mechanism.

Topic : Aromatic compounds
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.5

(3 marks, 3 min.)

M.M., Min.

[15, 15]

Multiple choice objective ('-1' negative marking) Q.6 to Q.8

(4 marks, 4 min.)

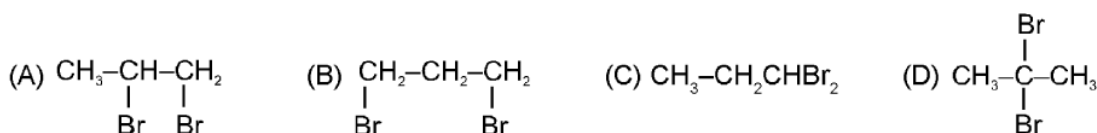
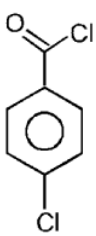
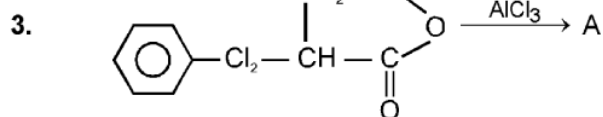
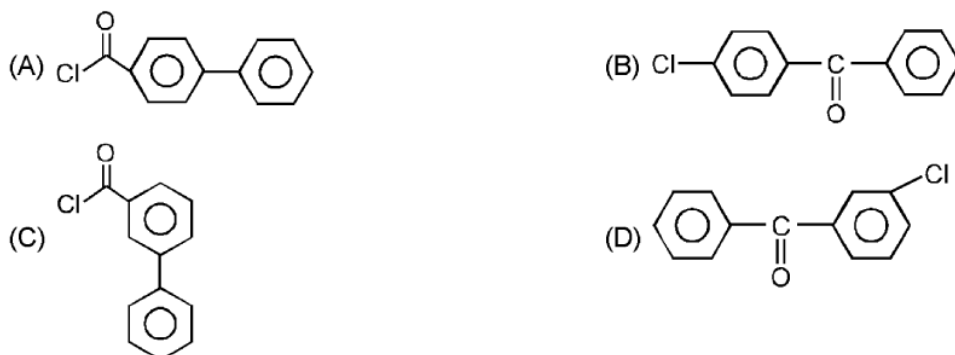
[12, 12]

Subjective Questions ('-1' negative marking) Q.9

(4 marks, 5 min.)

[4, 5]

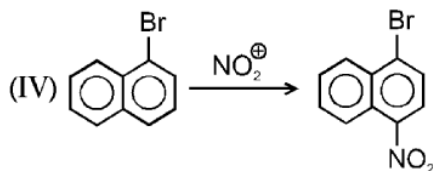
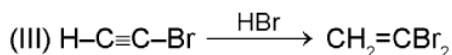
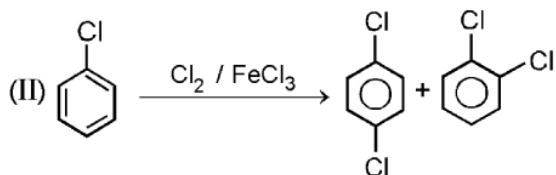
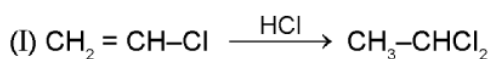
1. Allyl bromide during addition of HBr gives :


 2.  $\xrightarrow{\text{C}_6\text{H}_6/\text{AlCl}_3}$ P ; P is :


Find product A is :



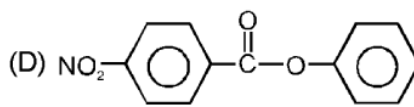
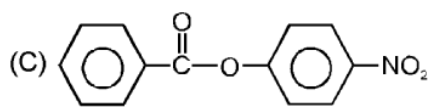
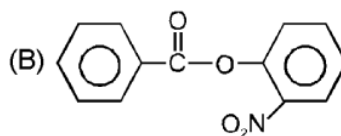
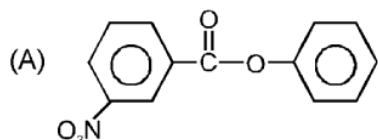
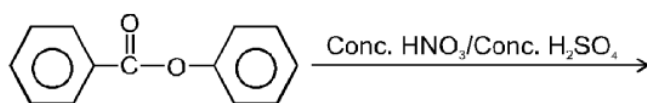
4. Which common factor is responsible for the regioselective nature of the following reactions.



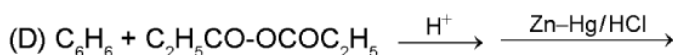
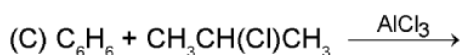
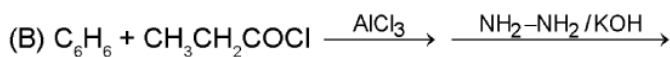
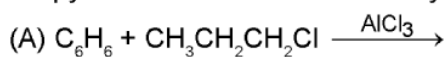
(A) – I effect of halogens
(C) + M effect of halogens

(B) + I effect of halogens
(D) – M effect of halogens

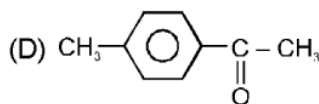
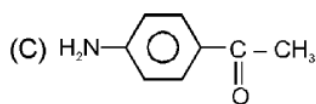
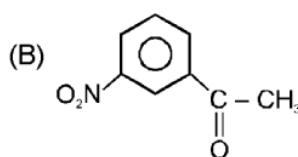
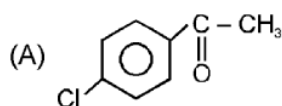
5. The major product formed in the reaction is,



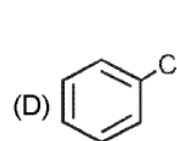
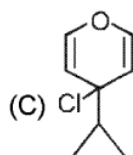
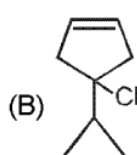
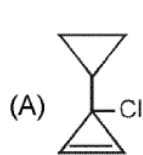
6.* Propyl benzene can be obtained by :



7.* Friedel craft acylation can not be used to obtain :



8.* Which can give white precipitate with AgNO_3



9. Halogens are deactivating groups but have ortho-para directing nature.

Topic : Aromatic compounds
Type of Questions

		M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.3	(3 marks, 3 min.)	[9, 9]
Multiple choice objective ('-1' negative marking) Q.4 to Q.5	(4 marks, 4 min.)	[8, 8]
True or False (no negative marking) Q.6	(2 marks, 2 min.)	[2, 2]
Subjective Questions ('-1' negative marking) Q.7	(4 marks, 5 min.)	[4, 5]

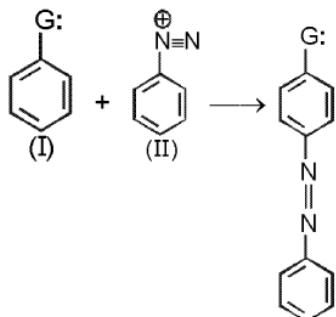
1. The intermediate formed during electrophilic substitution reaction of benzene is :
- (A) a non-aromatic resonance stable carbocation (B) a σ -complex
 (C) also known as Whealand's intermediate (D) All of these



The unsuitable reagent will be

- (A) $\text{CrO}_3 / \text{H}_2\text{O} / \text{acetone}$ (B) $[\text{Ag}(\text{NH}_3)_2]^\oplus$ (aqueous)
- (C) Alkaline KMnO_4 (D) $\begin{array}{c} \text{COONa} \\ | \\ (\text{CHOH})_2 \\ | \\ \text{COOK} \end{array} + \text{CuSO}_4 + \text{NaOH}$

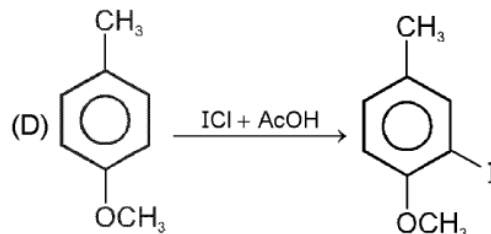
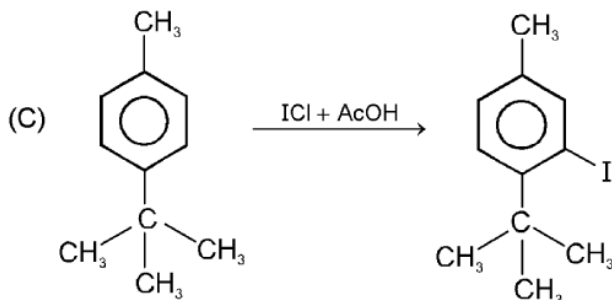
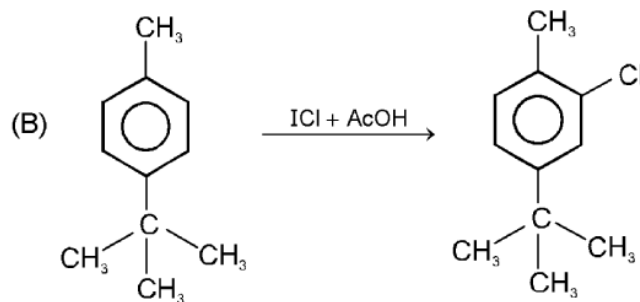
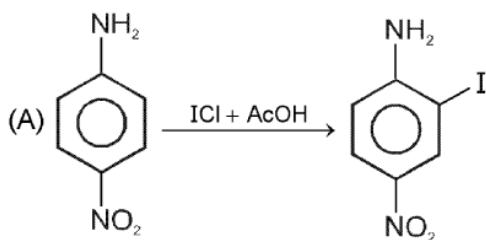
3. For the given reaction consider the statement 1,2 and 3



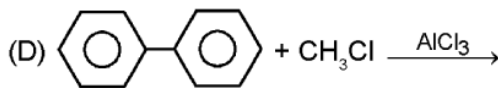
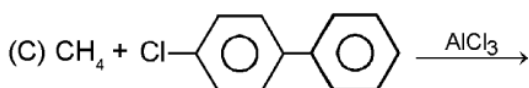
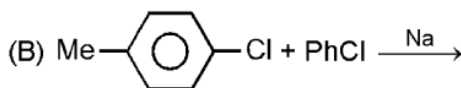
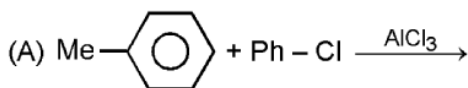
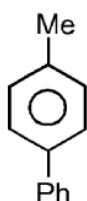
- (1) Presence of $-\text{NO}_2$ group in aromatic ring I will increase the rate of reaction.
 (2) Presence of $-\text{NO}_2$ group in aromatic ring II will increase the rate of reaction.
 (3) In this reaction a Wheland intermediate (σ complex) is formed.

- (A) TTT (B) FFF (C) FTT (D) FTF

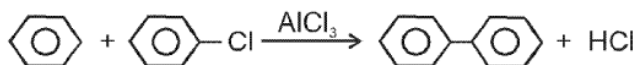
4. Which reaction show correct major product formation.



5. Which method can be used to prepare :



6. Diphenyl can not be prepared by following reaction .

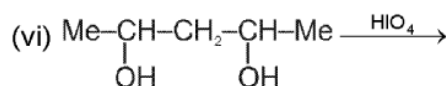
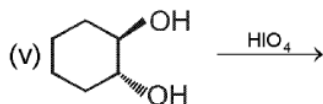
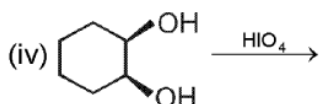
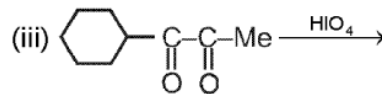
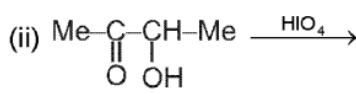
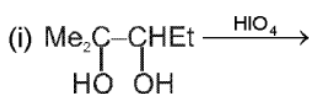


Reagent of the Week

Periodic Acid (HIO₄)

The important function of periodic acid is the oxidative cleavage of bonds with adjacent oxidisable groups for example - cis, 1, 2-diols, α -hydroxycarbonyl compounds, 1, 2-diketones etc. The reagent does not react with 1, 3 or 1, 4-diols or diketones.

7. The product(s) for each reaction is/are

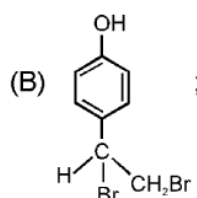
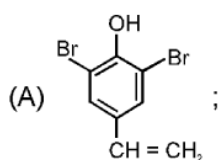
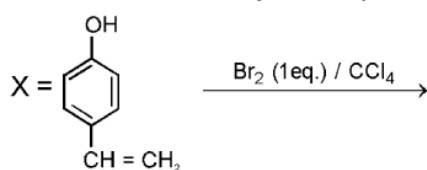


Topic : Aromatic compounds

Type of Questions

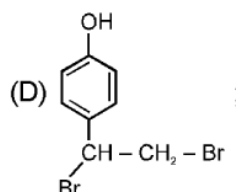
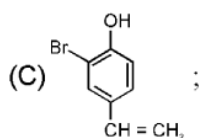
Type of Question	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.3	(3 marks, 3 min.) [9, 9]
Multiple choice objective ('-1' negative marking) Q.4 to Q.5	(4 marks, 4 min.) [8, 8]
Match the Following (no negative marking) Q.6	(8 marks, 10 min.) [8, 10]
Comprehension ('-1' negative marking) Q.7	(3 marks, 3 min.) [3, 3]

1. Observe the following reaction carefully. Select the correct answer regarding the major product formed and the relative reactivity of compound X with respect to ethene for the following reaction.



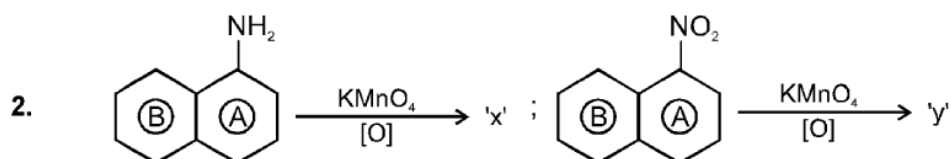
much less reactive than ethene

much more reactive than ethene

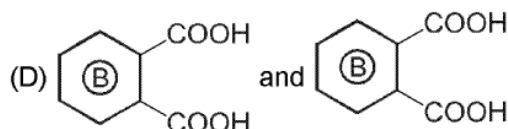
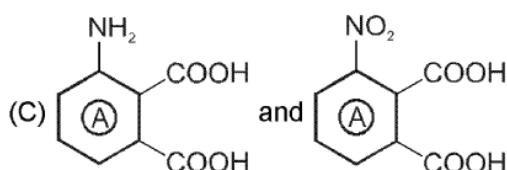
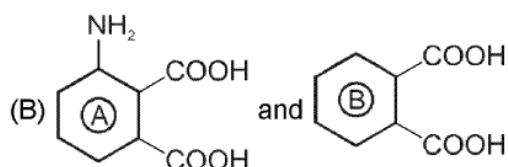
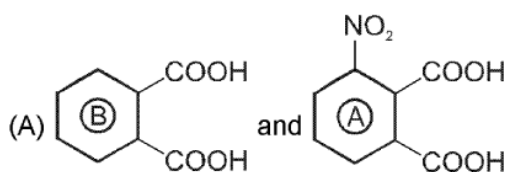


much more reactive than ethene

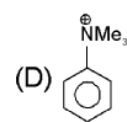
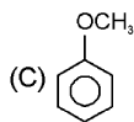
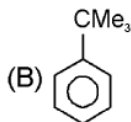
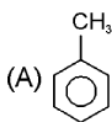
much less reactive than ethene



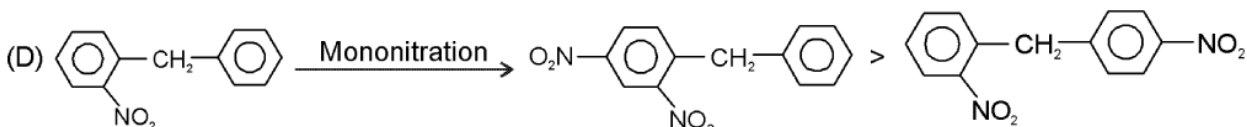
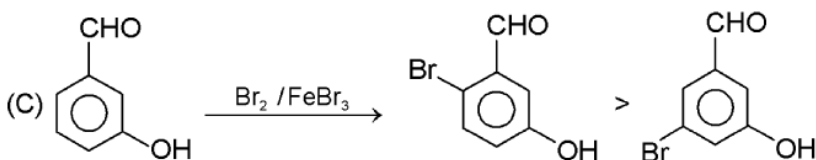
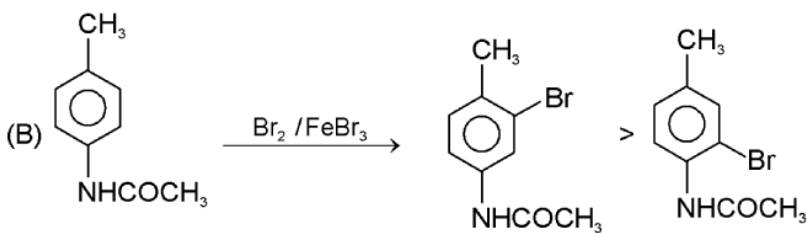
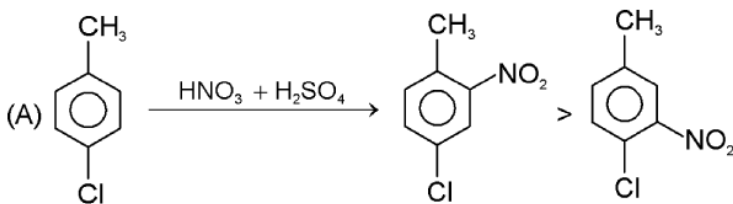
'x' and 'y' are respectively :



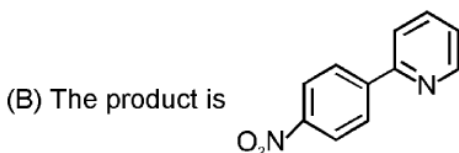
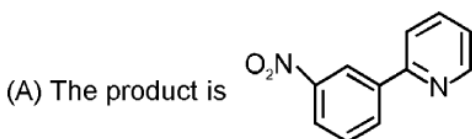
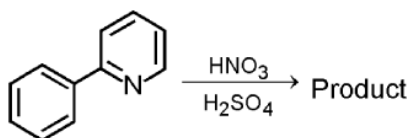
3. In which case the reaction with an electrophile, the product is 1, 3-disubstituted one ?



4.* Select the reactions in which the correct orientations have been mentioned in the major products.



5.* Which of the following statement is/are correct about the product



(C) Pyridine acts as a deactivating and meta directing

(D) pyridine acts as a activating and o,p -directing

6. Match the followings :

	% meta electrophilic substitution product
(A) Ar - CH ₃	(p) 64.6
(B) ArCH ₂ Cl	(q) 34
(C) ArCHCl ₂	(r) 4.5
(D) ArCCl ₃	(s) 15

Comprehension

Mild Oxidising agents :

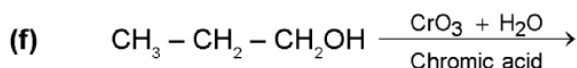
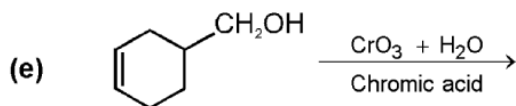
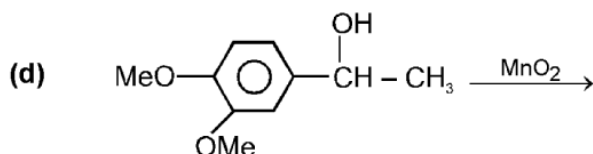
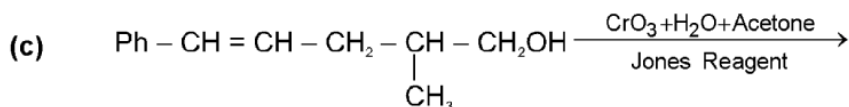
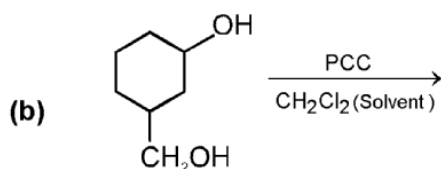
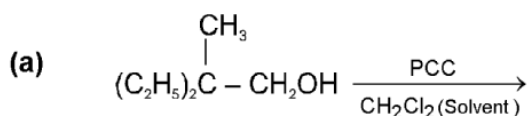
(i) Chromic Acid (H_2CrO_4) or ($\text{CrO}_3 + \text{H}_2\text{O}$) : It oxidises 1° alcohols to carboxylic acids and 2° alcohols to ketones without affecting olefinic double bonds ($\text{C} = \text{C}/\text{C} \equiv \text{C}$).

(ii) Pyridinium Chlorochromate (PCC) $\left[\text{C}_5\text{H}_5\text{N}^+\text{H} \text{CrO}_3\text{Cl}^- \right]$ or $[\text{CrO}_3 + \text{Py} + \text{HCl}]$: It oxidises 1° alcohols to aldehydes and 2° alcohols to ketones without affecting olefinic double bonds ($\text{C} = \text{C}/\text{C} \equiv \text{C}$).

(iii) Jones Reagent (Chromic acid in aqueous acetone) ($\text{CrO}_3 + \text{H}_2\text{O} + \text{Acetone}$) : It oxidises 1° alcohols to aldehydes and 2° alcohols to ketones without affecting olefinic double bonds ($\text{C} = \text{C}/\text{C} \equiv \text{C}$).

(iv) Manganese dioxide (MnO_2) : It oxidises allylic 1° and 2° alcohols, benzylic 1° and 2° alcohols to corresponding aldehydes and ketones.

7. Write product in each case :



ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 19

Total Marks : 32

Max. Time : 36 min.

Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.3

(3 marks 3 min.)

M.M., Min.

[9, 9]

Multiple choice objective ('-1' negative marking) Q.4

(4 marks 4 min.)

[4, 4]

Match the Following (no negative marking) Q.5

(8 marks 10 min.)

[8, 10]

Subjective Questions ('-1' negative marking) Q.6 to Q.7

(4 marks 5 min.)

[8, 10]

Comprehension ('-1' negative marking) Q.8

(3 marks 3 min.)

[3, 3]

1. The correct leaving group ability order for nucleophilic substitution reaction is :



(A) I > IV > II > III

(B) II > IV > III > I

(C) IV > I > III > II

(D) I > IV > III > II

2. The strongest nucleophile as well as best leaving group amongst the following is:

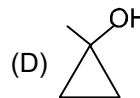
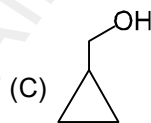
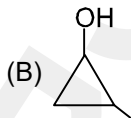
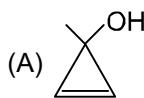
(A) Ph^\ominus

(B) $\text{CH}_3\text{-C}_6\text{H}_4\text{-SO}_3^\ominus$

(C) OH^\ominus

(D) I^\ominus

3. product :



4.* Which of the following represent correct order of Nucleophilicity is/are (In polar protic solvent) :

(A) $\text{F}^- < \text{Cl}^- < \text{Br}^- < \text{I}^-$

(B) $\text{PhS}^- > \text{PhO}^-$

(C) $\text{CH}_3\text{O}^- > \text{OH}^- > \text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^- > \text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^- > \text{C}_6\text{H}_5-\text{O}^-$

(D) $(\text{CH}_3)_3\ddot{\text{P}} > (\text{CH}_3)_3\ddot{\text{N}}$

5. Match the properties of column II with the pair given in column I.

Column - I

(A) $\text{NH}_2^\ominus < \text{N}_2$

(B) $\text{F}^\ominus < \text{I}^\ominus$

(C) $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^\ominus < \text{C}_6\text{H}_5-\text{O}^\ominus$

(D) <


Column - II

(p) leaving group ability in S_N reaction

(q) Nucleophilicity

(r) basicity

(s) Stability

6. Label each of the following solvent as Polar or non-polar :
- (a) $\text{CH}_3-\text{O}-\text{CH}_3$ (b) Benzene (c) DMF (d) CCl_4
 (e) DMSO (f) H_2O (g) Cyclohexane (h) Acetone
7. Cyclohexene  is treated with each of the following reagents-
- (a) O_3 followed by $\text{Zn}/\text{H}_2\text{O}$ (b) O_3 followed by H_2O_2
 (c) hot. conc. $\text{KMnO}_4/\text{OH}^\ominus$ (d) cold.dil. alkaline KMnO_4
 (e) $\text{OsO}_4/\text{H}_3\text{O}^\oplus$ (f) PhCO_3H followed by $\text{H}_3\text{O}^\oplus$
 Write product(s) obtained in each case.

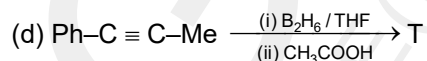
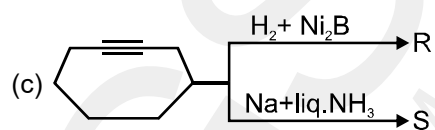
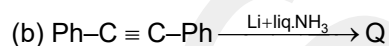
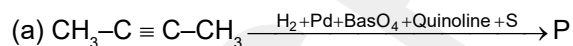
Comprehension

8. Partial reduction of Alkynes :

Partial reduction (partial hydrogenation) of alkynes to alkenes can be carried out by

- (i) Lindlar's Reagent $\rightarrow [\text{Pd} + \text{BaSO}_4 + \text{Quinoline} + \text{S}]$
 (ii) P-2 catalyst $\rightarrow (\text{Ni}_2\text{B})$
 (iii) Hydroboration- Reduction [(i) - B_2H_6]/THF (ii) $\text{H}_3\text{O}^\oplus$ or CH_3COOH
 (iv) Birch reduction $\rightarrow (\text{Li}/\text{liq. NH}_3$ or $\text{Na}/\text{liq. NH}_3$) (only non-terminal alkynes)
 First three are syn-addition but (iv)th is anti-addition.

Write product(s) in each case :



Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.5

(3 marks 3 min.)

M.M., Min.

[15, 15]

True or False (no negative marking) Q.6

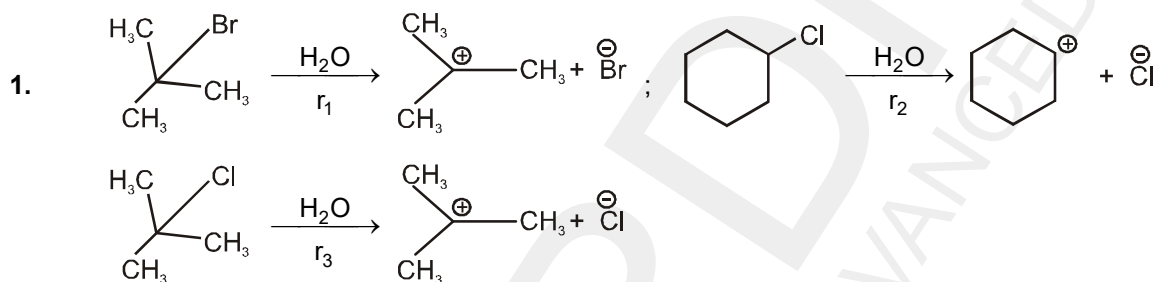
(2 marks 2 min.)

[2, 2]

Comprehension ('-1' negative marking) Q.7 to Q.10

(3 marks 3 min.)

[15, 15]



The rates r_1 , r_2 and r_3 are in the order :

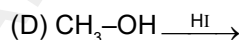
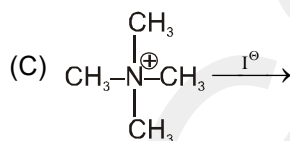
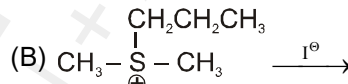
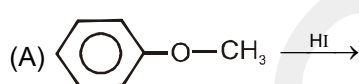
(A) $r_1 > r_2 > r_3$

(B) $r_3 > r_1 > r_2$

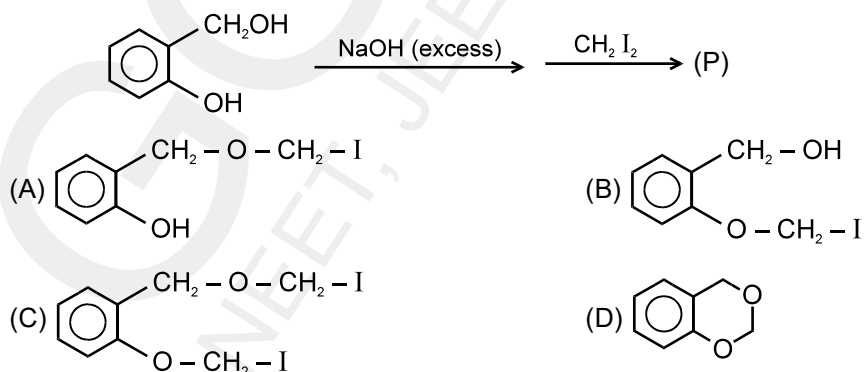
(C) $r_1 > r_3 > r_2$

(D) $r_2 > r_1 > r_3$

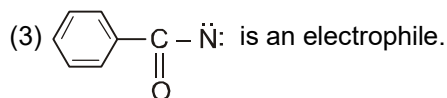
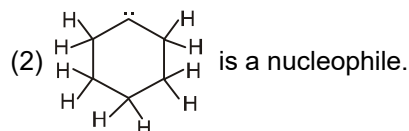
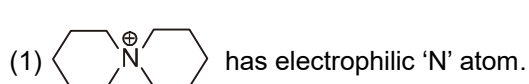
2. In which reaction methyl iodide is formed with fastest rate ?



3. The product 'P' of the following reaction is :



4. The correct order of true / false statements is :



(A) TTF

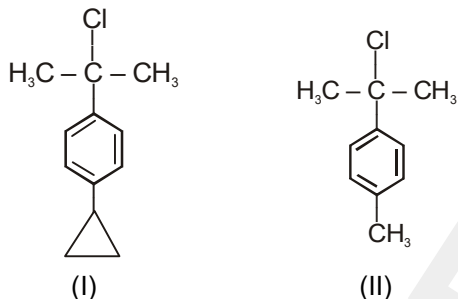
(B) TFT

(C) TFF

(D) FFT

5. C1=CC=CC=C1 $\xrightarrow[\text{Step-1}]{n\text{BuLi}}$ X + Y $\xrightarrow[\text{Step-2}]{\text{Cl}-\text{CH}_2\text{OCH}_3}$ C1=CC=CC=C1-CH₂-OCH₃ (product) (where Y = hydrocarbon)
- In the above reaction which of the following statement is correct ?
 (A) Step-1-is an S_N2 reaction
 (B) The hydrocarbon product of step-1 is CH₃(CH₂)₂CH₃.
 (C) X = cyclopentadiene
 (D) the nucleophile in 2nd reaction is cyclopentadienyl anion

6. (a) Rate of solvolysis of (I) is faster than (II).

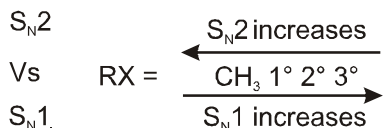
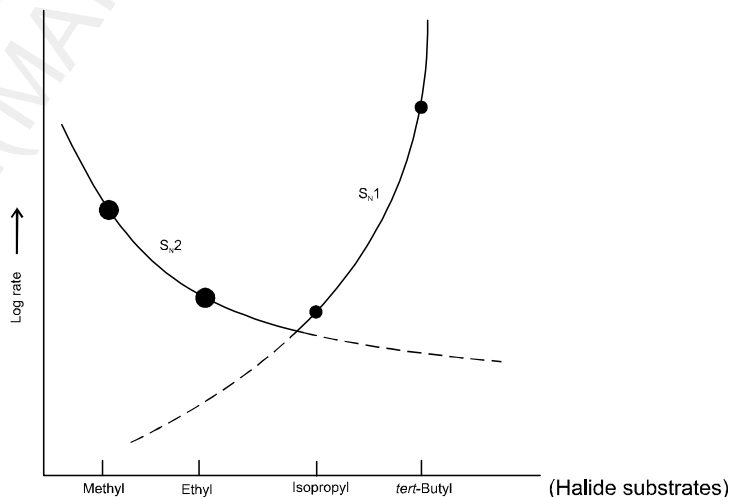


- (b) When $[\text{CH}_3-\text{C}(=\text{S})\text{O}^- \leftrightarrow \text{CH}_3-\text{C}(\text{S})\text{O}^-]$ attacks on CH₃-Br, the nucleophilic site is oxygen atom to give major product.

Comprehension # 1 (Ques. 7 to 9)

In 1935, E.D. Hughes and Christopher Ingold took these two sets of facts-kinetic order and relative reactivity and on them built a broad theory of nucleophilic aliphatic substitution. The keystone of their theory was this: that nucleophilic aliphatic substitution can proceed by two different mechanisms. These mechanism, for reason that will become clear, they named S_N2 and S_N1. Different substrates react by different kinetic orders because they are reacting by different mechanisms : some, like methyl, by S_N2; others, like tert-butyl, by S_N1.

Reactivity passes through a minimum with secondary substrates because the mechanism changes at this point, from S_N2 to S_N1. The occurrence of a minimum or maximum in a property-reactivity, acidity, etc. as one proceeds along a logical series, suggests the working of opposing factors. Here, Hughes and Ingold proposed, the factors are the opposing reactivity sequences for the two different mechanisms. As one passed along the series, reactivity by the S_N2 mechanism decreases from CH₃ to 1° and at 2° is so low that the S_N1 reaction begins to contribute significantly, reactivity, now by S_N1 rises sharply to 3° (figure).



7. Which of the following gives fastest S_N1 ?
 (A) Methylchloride
 (B) Ethylchloride
 (C) Isopropyl chloride
 (D) tert-Butyl chloride

8. Which of the following gives fastest S_N2 ?
 (A) Methyl iodide (B) Ethyl iodide
 (C) Isopropyl iodide (D) tert-Butyl iodide
9. Which can show both S_N1 and S_N2 equally good ?
 (A) Methyl iodide (B) Ethyl iodide
 (C) Isopropyl iodide (D) tert-Butyl iodide

Comprehension # 2

10. Metal Hydrides

- (a) **NaBH₄** Sodium borohydride is a milder reducing agent. It reduces aldehydes, ketones and acid chlorides to alcohols and alkyl halides to alkanes. It does not affect C=C, C≡C.
- (b) **LiAlH₄** (LAH) Lithium aluminium hydride is stronger reducing agent than NaBH₄. It reduces almost all functional groups and generally does not affect C=C/C≡C.

Write Yes or No

	Reduction Reaction	Reduction is possible by	
		LiAlH ₄	NaBH ₄
(i)	$R-CH=O \longrightarrow R-CH_2-OH$	Yes	Yes
(ii)	$R-\overset{\text{O}}{\underset{\text{O}}{\parallel}}{C}-OH \longrightarrow R-CH_2-OH$	Yes	No
(iii)	$R-\overset{\text{O}}{\parallel}{C}-Cl \longrightarrow R-CH_2-OH$	.....	.....
(iv)	$R-\overset{\text{R}}{\underset{\text{R}}{\diagdown}}{C}=O \longrightarrow R-\overset{\text{R}}{\underset{\text{R}}{\diagdown}}{C}H-OH$	.....	.....
(v)	$R-\overset{\text{O}}{\parallel}{C}-OR' \longrightarrow R-CH_2OH + R'OH$	.....	.....
(vi)	$R-\overset{\text{R}}{\underset{\text{R}}{\diagdown}}{C}H-Cl \longrightarrow R-\overset{\text{R}}{\underset{\text{R}}{\diagdown}}{C}H_2 + HCl$	.....	.....
(vii)	$R-C\equiv N \longrightarrow R-CH_2-NH_2$	.....	.....
(viii)	$R-\overset{\text{O}}{\parallel}{C}-NHR' \longrightarrow R-CH_2-NHR'$	.....	.....
(ix)	$R-NO_2 \longrightarrow RNH_2$	.....	.....
(x)	$R-CH=CH-R \longrightarrow R-CH_2-CH_2-R$	.....	.....

Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks 3 min.)

M.M., Min.

[18, 18]

True or False (no negative marking) Q.7

(2 marks 2 min.)

[2, 2]

Comprehension ('-1' negative marking) Q.8

(3 marks 3 min.)

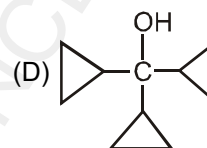
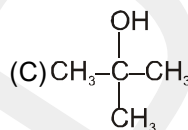
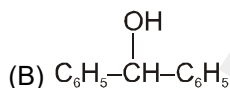
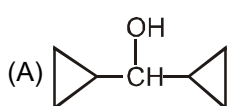
[3, 3]

Subjective Questions ('-1' negative marking) Q.9

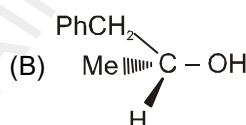
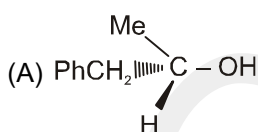
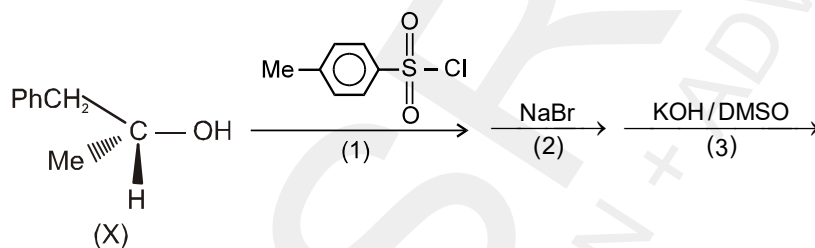
(4 marks 5 min.)

[4, 5]

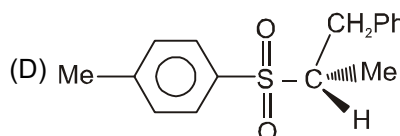
1. Which one of the following will be most reactive for S_N1 reaction ?



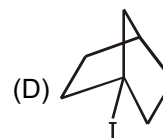
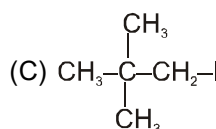
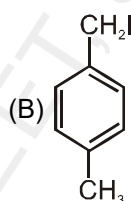
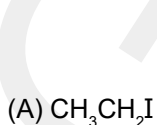
2. In the following reaction product is :



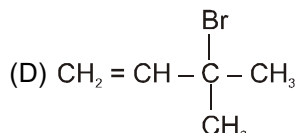
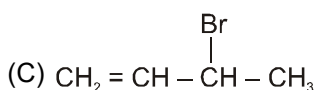
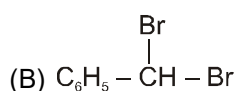
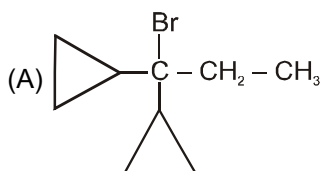
(C) A and B both



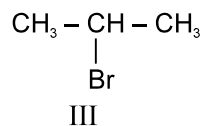
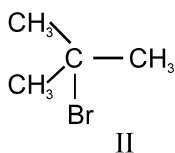
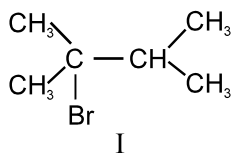
3. Substrate that show E1 reaction



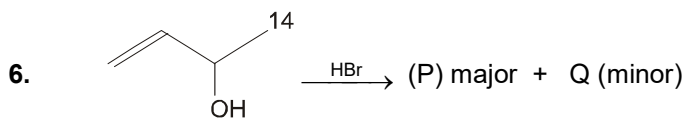
4. Which of the following will be most reactive for E1 reaction ?



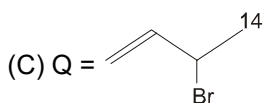
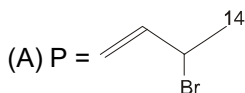
5. Write the correct reactivity order with alcoholic NaOH for the following compounds ?



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

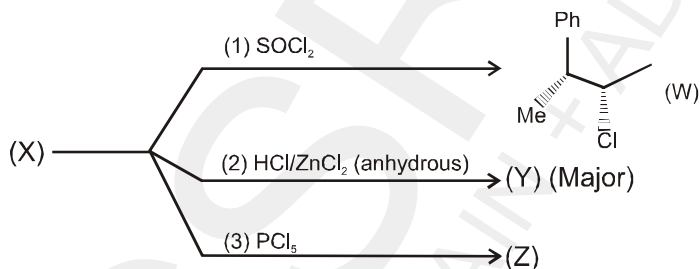


Which of the following is/are correct :

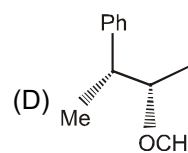
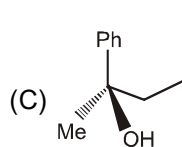
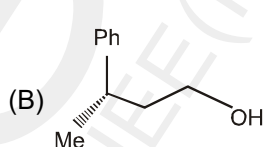
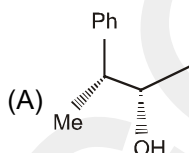


7. Aryl halides undergo nucleophilic substitution with ease.

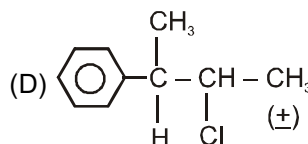
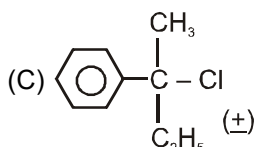
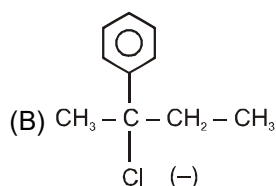
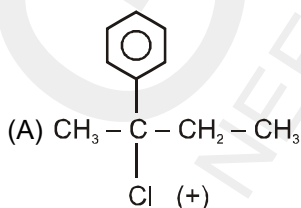
8. **Comprehension :**



(a) The compound (X) is



(b) The compound (Y) is



(c) What is true about (Z)

(A) It is identical to (W)

(B) It is enantiomer of (W)

(C) It is diastereomer of (W)

(D) It is structural isomer of (W)

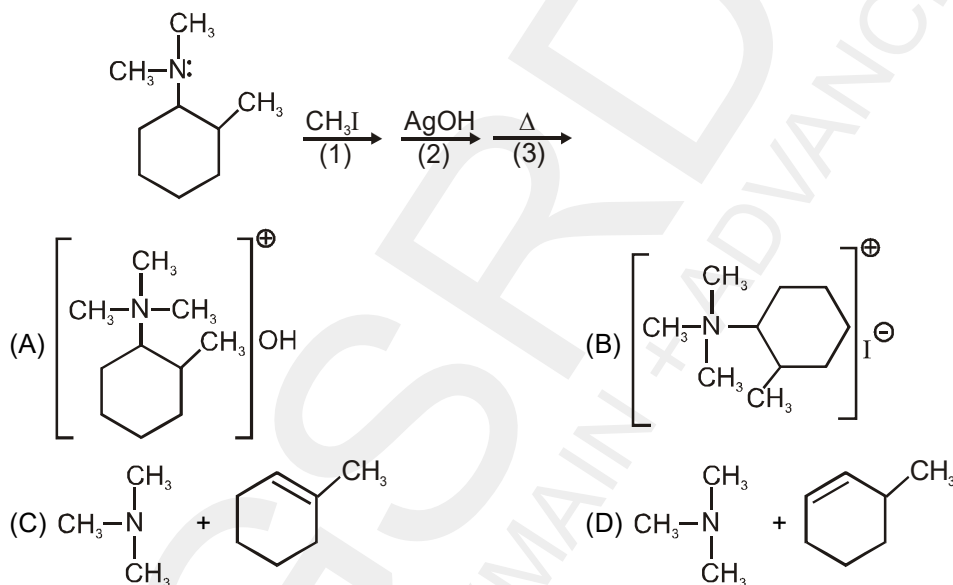
9. Explain Lucas test used to distinguished primary, secondary and tertiary alcohol.

Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

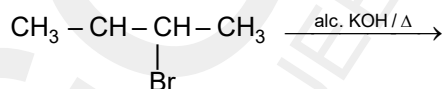
Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks 3 min.)	M.M., Min. [12, 12]
Multiple choice objective ('-1' negative marking) Q.5 to Q.6	(4 marks 4 min.)	[8, 8]
Short Subjective Questions ('-1' negative marking) Q.7	(3 marks 3 min.)	[3, 3]
Match the Following (no negative marking) Q. 8	(8 marks 10 min.)	[8, 10]
Subjective Questions ('-1' negative marking) Q.9	(4 marks 5 min.)	[4, 5]

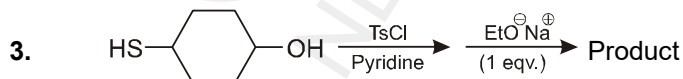
1. The major product of following sequence of reactions is :



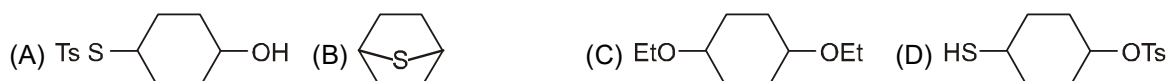
2. For the given reaction choose the correct option:



- (A) Reaction is regioselective but not stereoselective.
 (B) Reaction is stereoselective but not regioselective.
 (C) Reaction is both regioselective and stereoselective.
 (D) Reaction is none of regioselective and stereoselective.



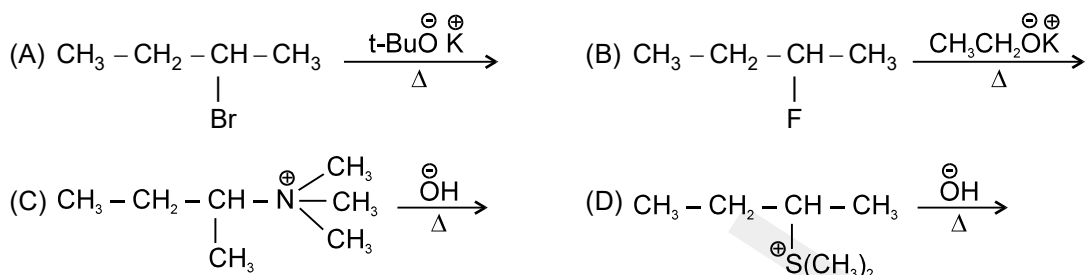
The product is :

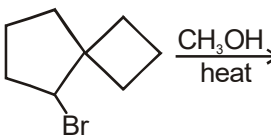


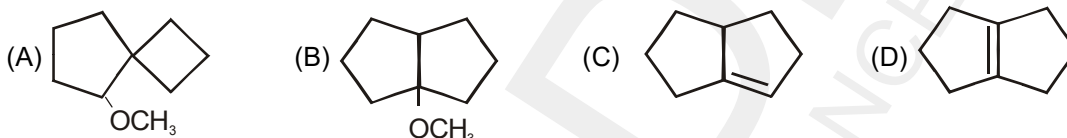
4. The correct statement(s) about $\text{C}_5\text{H}_{11}\text{Br}$ is/are :

- (A) Total 8 structural isomers are possible for $\text{C}_5\text{H}_{11}\text{Br}$
 (B) Two out of the all structural isomers of $\text{C}_5\text{H}_{11}\text{Br}$ are inert towards E-2 reaction
 (C) Only one out of all structural isomers of $\text{C}_5\text{H}_{11}\text{Br}$ gives three products in E-2 reaction.
 (D) Only two out of all structural isomers of $\text{C}_5\text{H}_{11}\text{Br}$ produce alkene which can show geometrical isomerism.

5*. In which reaction product formation takes place by Hoffmann rule ?



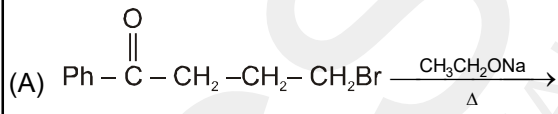
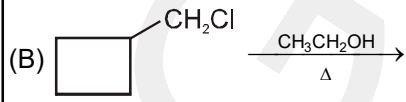
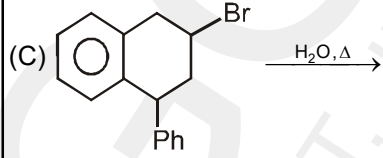
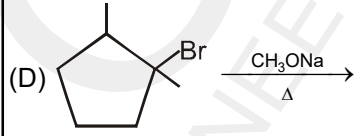
6*.  product, which of the following products are possible ?



7. The rate of bimolecular elimination reaction of $\text{CH}_3 - \text{CH}_2 - \text{Br}$ is faster than $\text{CD}_3 - \text{CH}_2 - \text{Br}$.

8. **Matching**

More than one option of column-II may match with one option of column-I.

Column – I (Reactions)	Column – II (Mechanism for major product)
(A) 	(p) $\text{S}_{\text{N}}1$
(B) 	(q) $\text{S}_{\text{N}}2$
(C) 	(r) E1
(D) 	(s) E2
	(t) E1cB

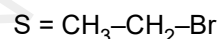
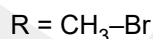
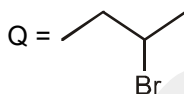
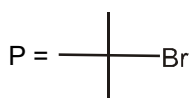
9. You have the task of preparing styrene ($\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$) by dehydrohalogenation of either 1-bromo-2-phenylethane or 1-bromo-1-phenylethane using KOH in ethanol. Which alkyl halide would you choose as your starting material to give the better yield of the alkene ? Explain your answer

Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

Type of Questions

Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.3	(3 marks 3 min.) [9, 9]
Multiple choice objective ('-1' negative marking) Q.4	(4 marks 4 min.) [4, 4]
Subjective Questions ('-1' negative marking) Q.5 to Q.6	(4 marks 5 min.) [8, 10]
Comprehension ('-1' negative marking) Q.7 to Q.9	(3 marks 3 min.) [9, 9]

1. Correct order of E_2/S_N2 ratio is :



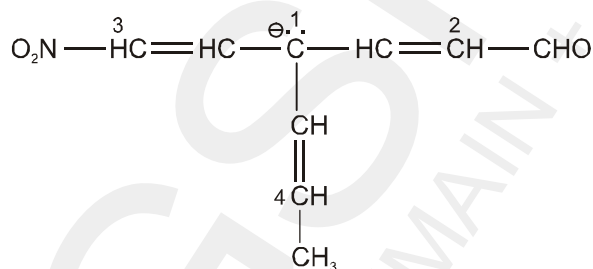
(A) $P > Q > S > R$

(B) $P > Q > R > S$

(C) $R > S > Q > P$

(D) $P > S > Q > R$

2. The carbanion is most nucleophilic when the -ve charge is present at

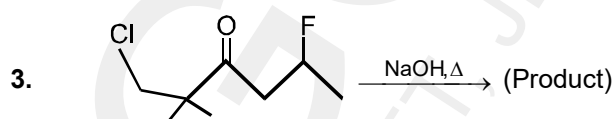


(A) 1

(B) 2

(C) 3

(D) 4



The major product of the above reaction is obtained by mechanism

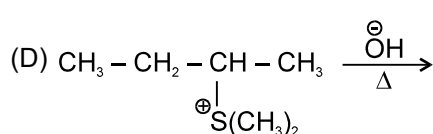
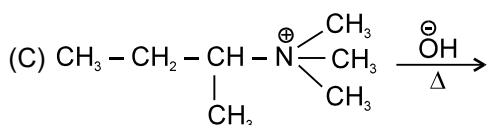
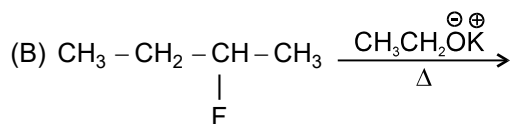
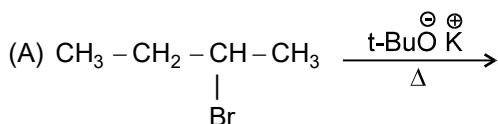
(A) S_N2

(B) E2

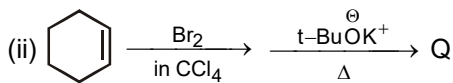
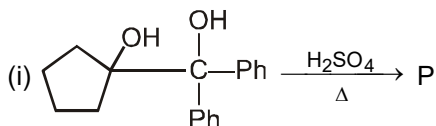
(C) E1cB

(D) $S_N2, E2$ mixed mechanism

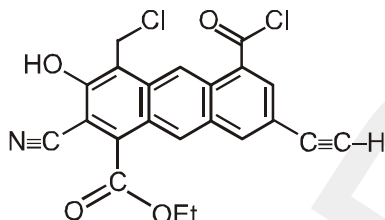
4*. In which reaction product formation takes place by Hoffmann rule ?



5. Write the structure of final product of each of the following :

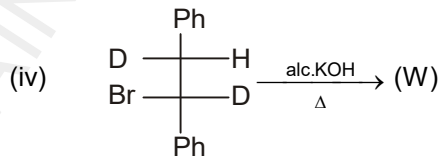
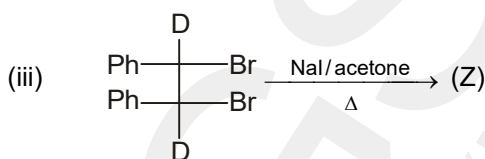
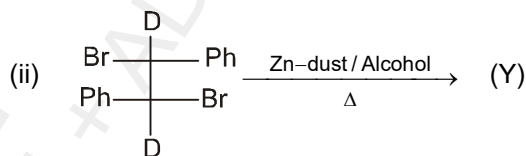
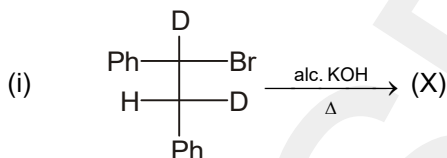


6. How many moles of MeMgI will be consumed by one mole of the following compound.



Comprehension

Observe the following reactions (i) to (iv) and answer questions



7. X and Y are
 (A) Positional isomers
 (B) Geometrical isomers
 (C) Identical compounds
 (D) Optical isomers
8. X and Z are
 (A) Identical compounds
 (B) Geometrical isomers
 (C) Structural isomers
 (D) Homologues
9. X and W are
 (A) Identical compounds
 (B) Optical Isomers
 (C) Geometrical isomers
 (D) Positional isomers

ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 24

Total Marks : 33

Max. Time : 33 min.

Topic : Haloalkene and Haloarenes

Type of Questions

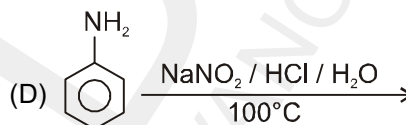
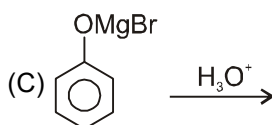
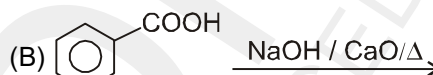
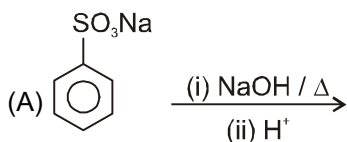
Single choice Objective ('-1' negative marking) Q.1 to Q.11

(3 marks 3 min.)

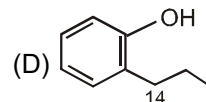
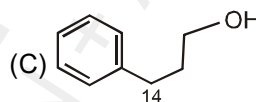
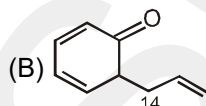
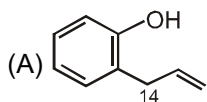
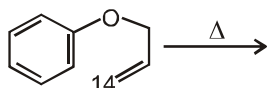
M.M., Min.

[33, 33]

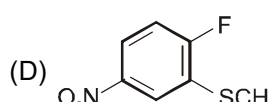
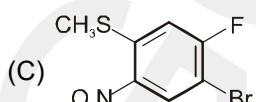
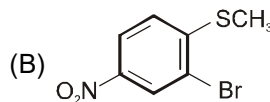
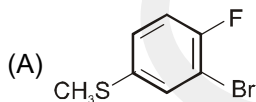
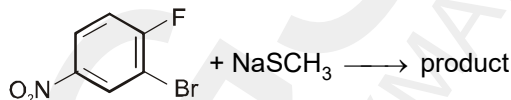
1. Phenol is not obtained by :



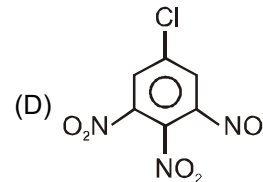
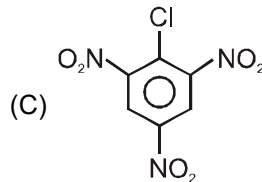
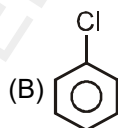
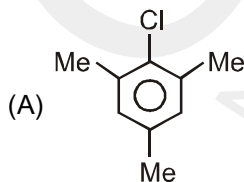
2. The product of the following reaction is :

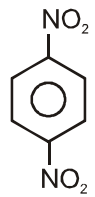


3. Identify the principal organic product of the following reaction,



4. Which of the following compound will react with fastest rate with aq. NaOH.



5.  $\xrightarrow{\text{NH}_4\text{SH}}$ $\xrightarrow[\text{excess}]{\text{Br}_2/\text{H}_2\text{O}}$ $\xrightarrow[\text{HCl}]{\text{NaNO}_2}$ $\xrightarrow{\text{CuBr-HBr}}$ $\xrightarrow{\text{Sn/HCl}}$ $\xrightarrow{\text{Br}_2/\text{H}_2\text{O}}$ major end product.

Find the total number of halogen atoms present in the major end product :

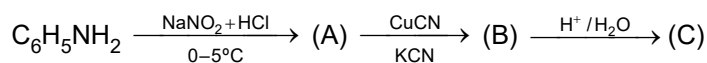
(A) 4

(B) 5

(C) 6

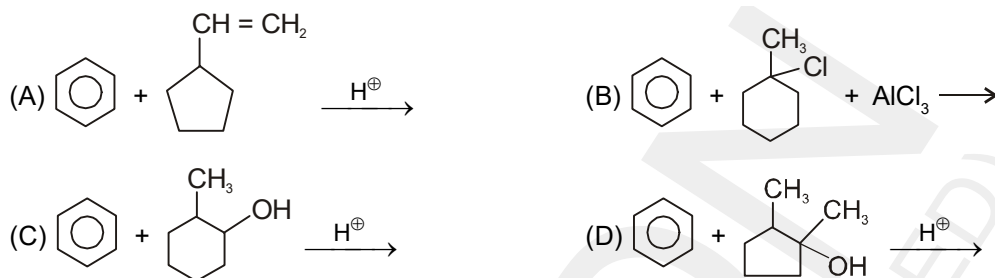
(D) 3

6. In the reaction, the product (C) is :

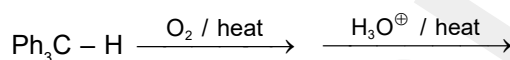


- (A) $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$ (B) $\text{C}_6\text{H}_5\text{COOH}$ (C) $\text{C}_6\text{H}_5\text{OH}$ (D) none of these

7. Which of the following reaction not give same product.

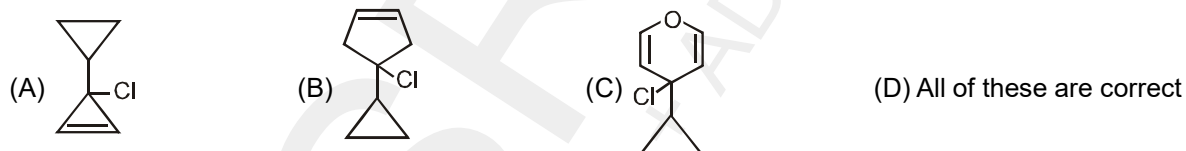


8. Which of the following products will be formed in the given reaction –

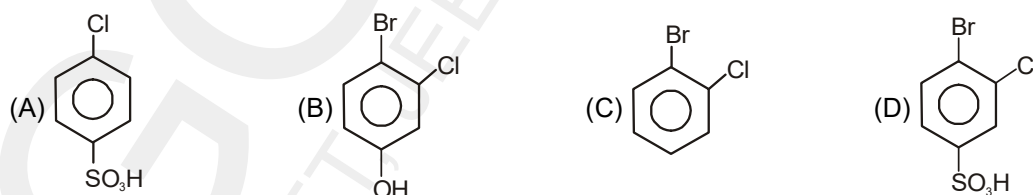
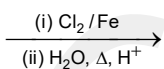
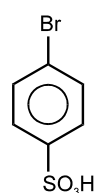


- (A) PhCH_2OH (B) $\text{Ph}-\text{OH}$ (C) $\text{Ph}_2\text{C}=\text{O}$ (D) 2 and 3 both

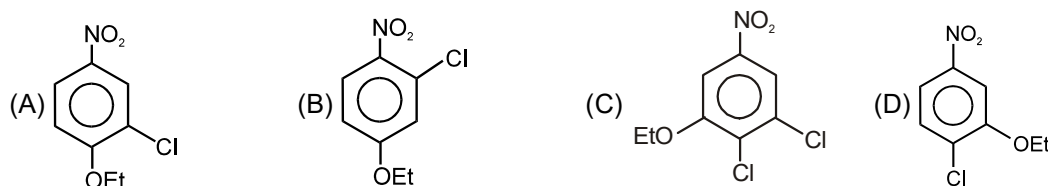
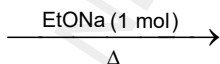
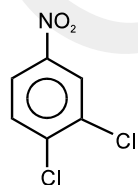
9. Which can give white precipitate with AgNO_3



10. Identify the product



11. The product is :



Topic : Haloalkene and Haloarenes

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.3

(3 marks 3 min.)

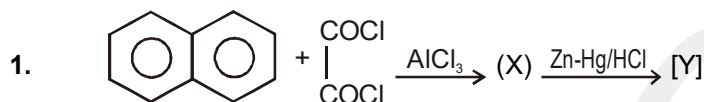
M.M., Min.

[9, 9]

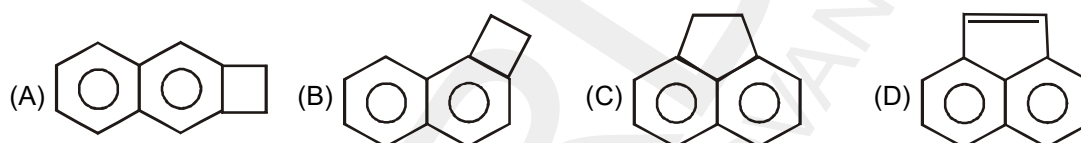
Fill in the Blanks ('-1' negative marking) Q.4

(3 marks 3 min.)

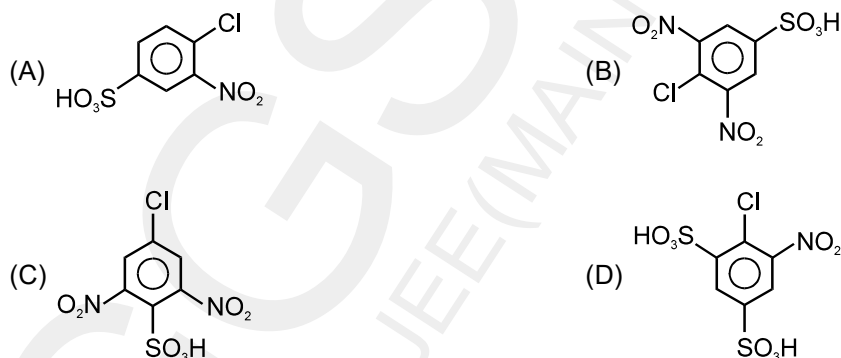
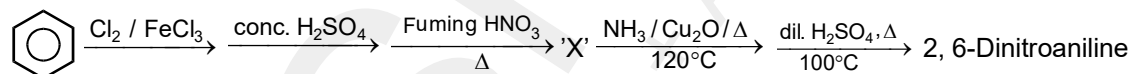
[3, 3]



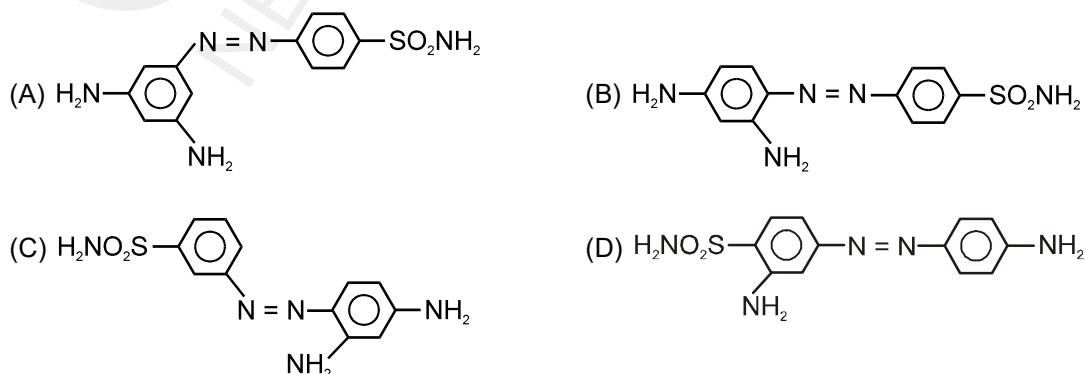
Y is



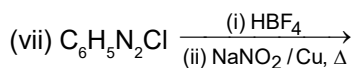
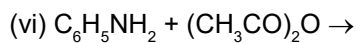
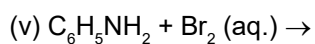
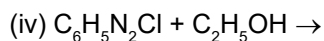
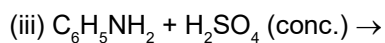
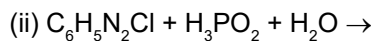
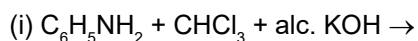
2. The intermediate product 'X' of following synthesis is identified as :



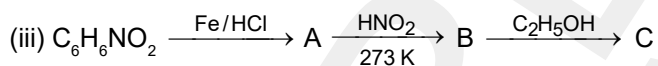
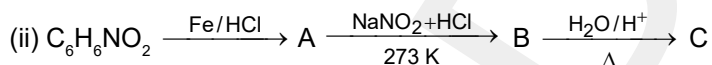
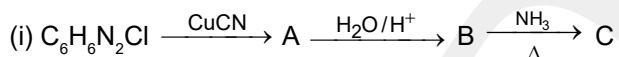
3. Prontosil is a sulphonamide drug used in medicine. It is prepared by diazotising sulphanilamide (p-Amino benzene sulphonamide) and then its coupling with m-phenylene diamine. The structure of prontosil is



4. (a) Complete the following reactions :



(b) Give the structures of A, B and C in the following reactions :



ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 26

Total Marks : 25

Max. Time : 26 min.

Topic : Haloalkene and Haloarenes

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.7

(3 marks 3 min.)

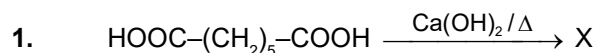
M.M., Min.

[21, 21]

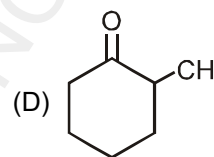
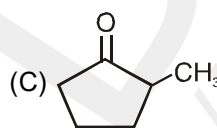
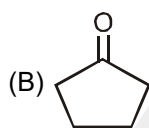
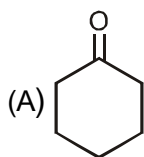
Subjective Questions ('-1' negative marking) Q.8

(4 marks 5 min.)

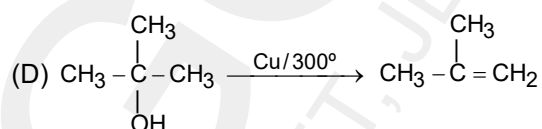
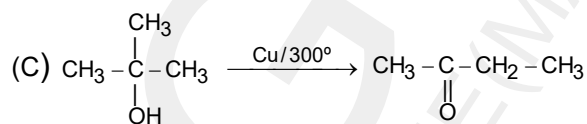
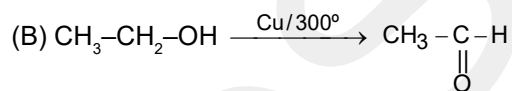
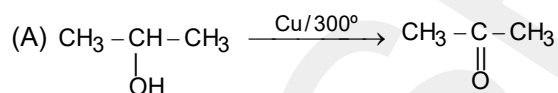
[4, 5]



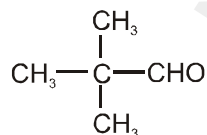
Compound X is :



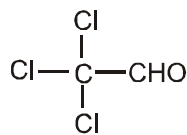
2. Which of the following reaction is incorrect ?



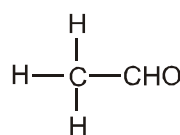
3. The relative rates of following compounds towards nucleophilic addition reaction follow the order.



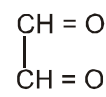
(I)



(II)



(III)



(IV)

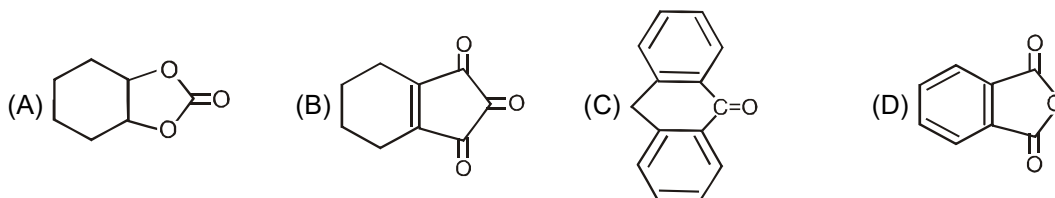
(A) I > II > III > IV

(B) II > IV > I > III

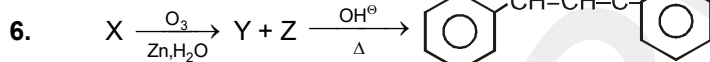
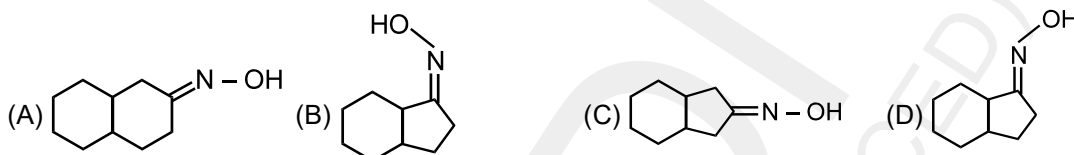
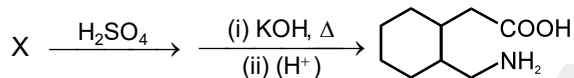
(C) III > IV > II > I

(D) IV > II > III > I

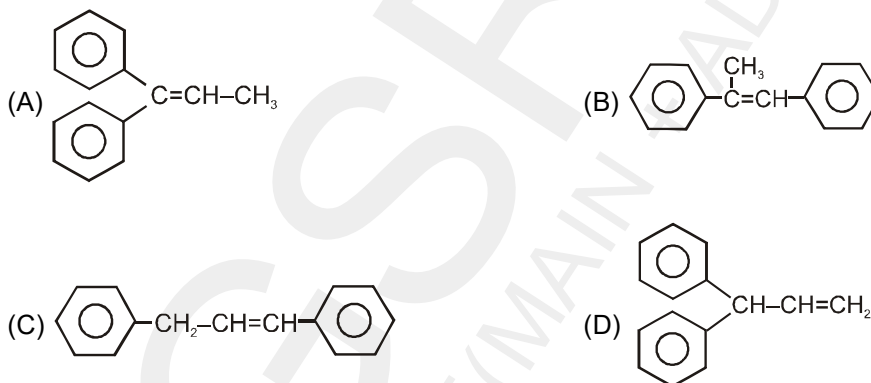
4. The stable hydrate is formed by

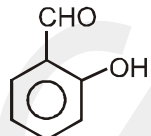


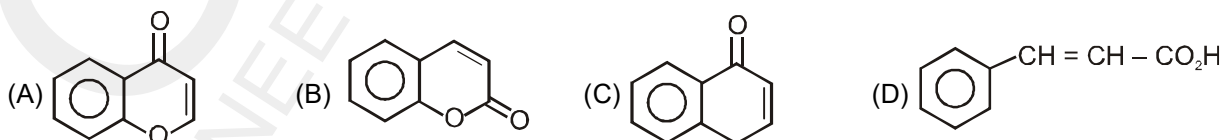
5. Identify 'X' in the following reaction



Compound X in the above reaction is



7.  $\xrightarrow[\text{(2) } H_2O]{\text{(1) } Ac_2O, AcONa}$ (A), Identify product



8. (a) Give one chemical test to distinguish between the following pairs of compounds
 (i) Ethylamine and aniline (ii) Aniline and benzylamine (iii) Aniline and N-methylaniline.

(b) Accomplish the following conversions :

- (i) Nitrobenzene to benzoic acid (ii) Benzene to m-bromophenol
 (iii) Benzoic acid to aniline (iv) Aniline to 2, 4, 6-tribromofluorobenzene
 (v) Benzyl chloride to 2-phenylethanamine (vi) Chlorobenzene to p-chloroaniline
 (vii) Aniline to p-bromoaniline (viii) Benzamide to toluene
 (ix) Aniline to benzyl alcohol (x) Aniline to 1, 3, 5-tribromobenzene.

Topic : Aldehydes, Ketones

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.3

(3 marks 3 min.)

M.M., Min.

[12, 12]

Comprehension ('-1' negative marking) Q.4 to Q.6

(3 marks 3 min.)

[12, 12]

Subjective Questions ('-1' negative marking) Q.7

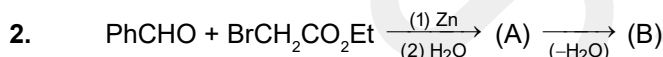
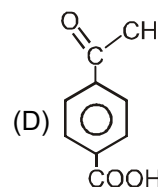
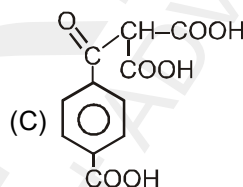
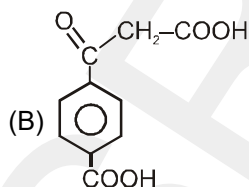
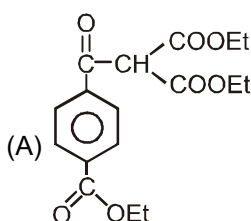
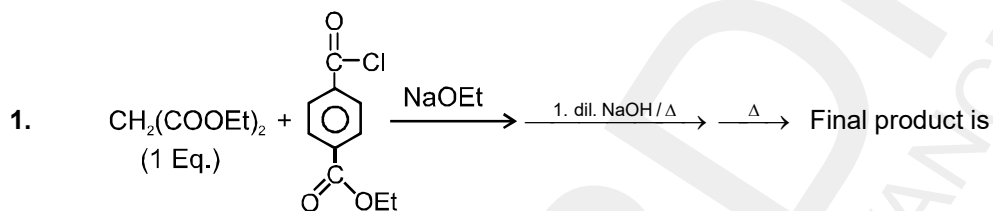
(4 marks 5 min.)

[4, 5]

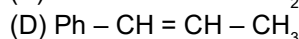
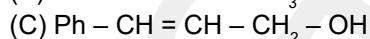
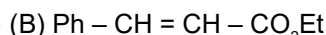
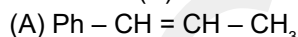
Match the Following (no negative marking) Q. 8

(8 marks 10 min.)

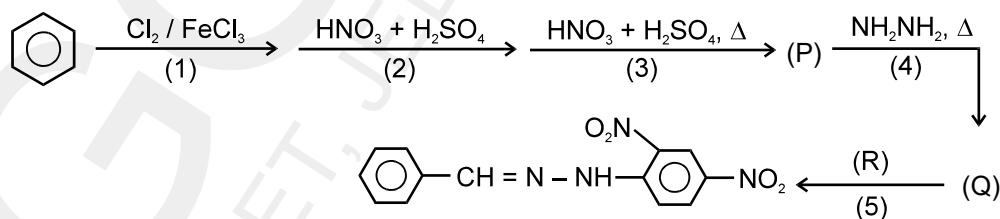
[8,10]



Product of (B) of the above reaction is :



3.* The correct statement/s about the following reaction sequence is / are



(A) 'R' gives an aldol condensation reaction on heating with NaOH solution

(B) The compound 'Q' gives a yellow precipitate in acetone

(C) Step '4' is an aromatic nucleophilic substitution reaction

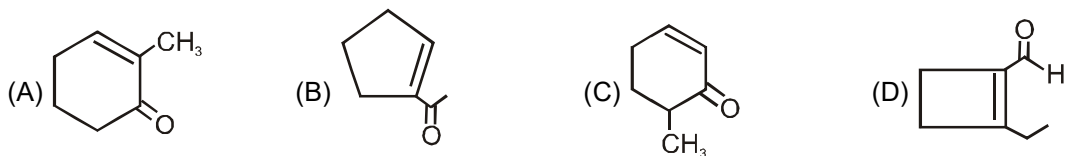
(D) The end product is a mixture of three compounds

Comprehension # (Q. 4 to 6)

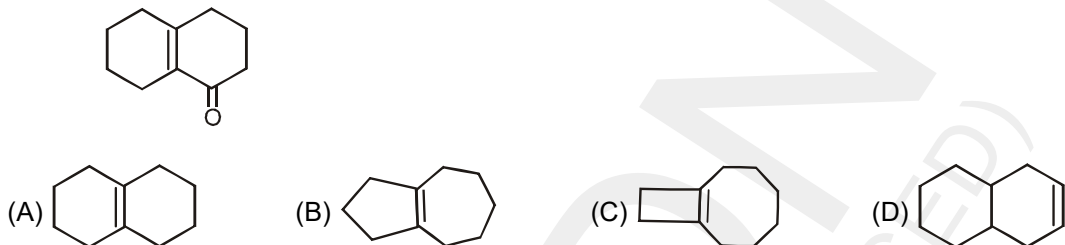
Intramolecular aldol condensation :

The aldol condensation also offer a convenient way to synthesize molecules with five and six membered ring. This can be done by an intramolecular aldol condensation using a dialdehyde, a keto aldehyde or a diketone as the substrate. The major product is formed by the attack of the enolate from the ketone side of the molecule that adds to the aldehyde group. The reason the aldehyde group undergoes addition preferentially may arise from the greater reactivity of aldehyde towards nucleophilic addition generally. In reaction of this type five membered rings form far more readily than seven membered rings and six membered rings are more favorable than four or eight membered rings when possible.

4. 1-Ethylcyclopent-1-ene on reductive ozonolysis followed by aq. NaOH/ Δ gives



5. Which of the following compound on reaction with O_3/Zn , H_2O followed by aq. NaOH/ Δ will form

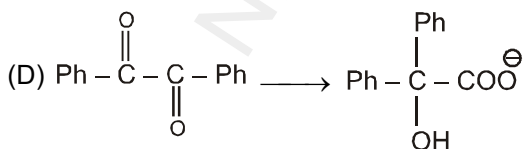
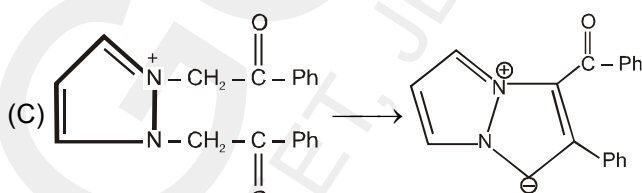
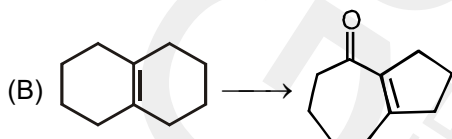
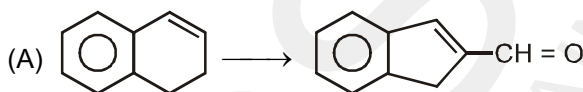


6. The true statement about the major product of $CH_3-C(=O)-CH_2-CH_2-CH_2-CH_2-C(=O)-H$ in reaction with aq. NaOH followed by heating is.

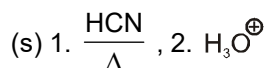
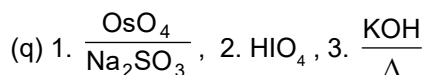
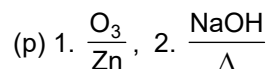
- (A) It gives yellow ppt with I_2/OH^- (B) It gives silver mirror with Tollen's reagent
 (C) It shows stereoisomerism (D) It does not give yellow ppt with 2,4 DNP

7. Match the correct reagents for the following transformations

Column-I
(Transformations)



Column-II
(Reagents)



8. How will you convert ethanal into the following compounds ?

- (i) Butane-1, 3-diol (ii) But-2-enal (iii) But-2-enoic acid

ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 28

Total Marks : 32

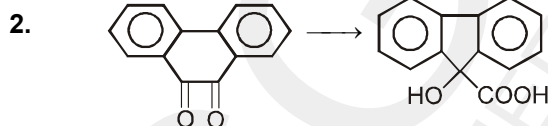
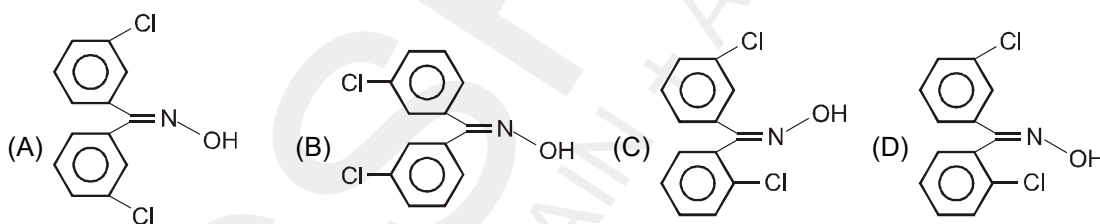
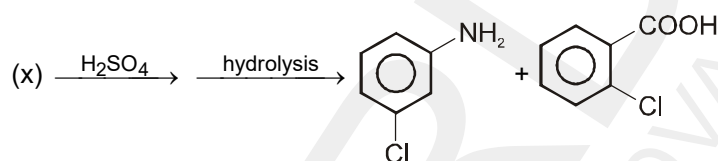
Max. Time : 35 min.

Topic : Aldehydes, Ketones

Type of Questions

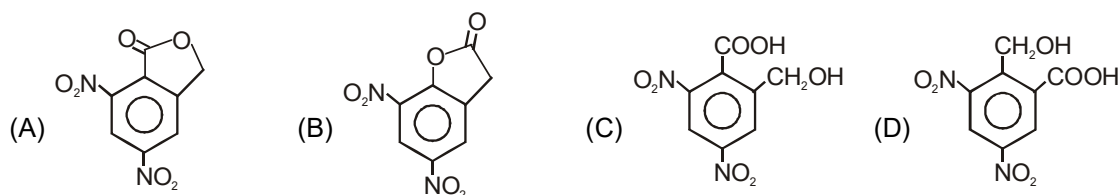
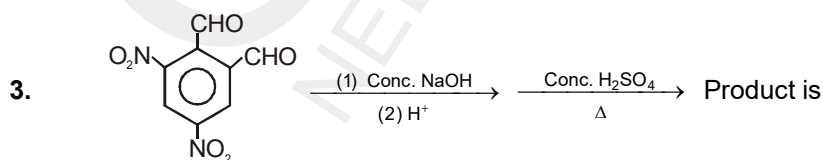
Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.3	(3 marks 3 min.) [9, 9]
Comprehension ('-1' negative marking) Q.4 to Q.6	(3 marks 3 min.) [9, 9]
True or False (no negative marking) Q.7	(2 marks 2 min.) [2, 2]
Subjective Questions ('-1' negative marking) Q.8	(4 marks 5 min.) [4, 5]
Match the Following (no negative marking) (2 × 4)	(8 marks 10 min.) [8, 10]

1. The reactant 'x' is :



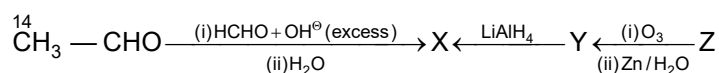
Above conversion can be carried out by :

- (A) $\text{LiAlH}_4, \text{H}^+, \Delta$ (B) (i) OH^- (conc.), Δ (ii) H^+
 (C) (i) H^+, Δ (ii) OH^- (D) (i) NaBH_4 (ii) H^+

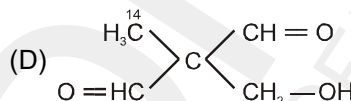
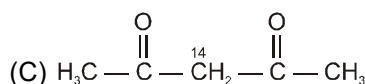
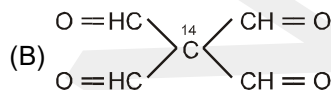
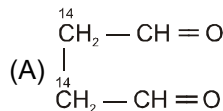


Comprehension (Q. 4 to 6)

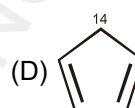
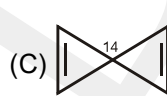
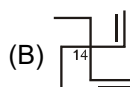
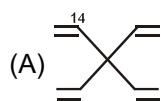
Acetaldehyde with one labelled carbon (C – 14) is treated with excess of formaldehyde in presence of alkali to form the compound X. Compound X can also be formed when compound Z undergoes reductive ozonolysis followed by treatment with LiAlH_4 .



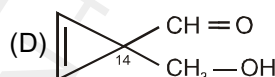
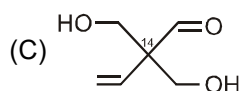
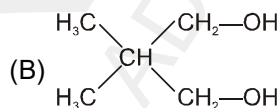
4. The compound Y can be :



5. The compound Z is :



6. The compound X is :



7. p-Toluidine and p-cresol are distinguished by using $\text{NaNO}_2/\text{HCl}/0^\circ\text{C}$ followed by β -Naphthol.

8. $\text{CH}_3 - \text{CH} = \text{O} + \text{CH}_3\text{CH}_2 - \text{CH} = \text{O} \xrightarrow[\Delta]{\text{HO}^\ominus}$ mixture of aldols
 (z) total number of aldols including stereoisomers.

Report your answer as (z – 5).

9. Match the reaction in column-I with appropriate option in column II.

Column-I	Column-II
(A) $\text{Ph} - \text{CH} = \text{CH}_2 \xrightarrow{\text{HBr}} \text{Ph} - \overset{\text{Br}}{\text{CH}} - \text{CH}_3$	(p) Substitution reaction
(B) $\text{Ph} - \text{N} = \text{N} - \text{C}_6\text{H}_4 - \text{OH}$	(q) Addition reaction
(C) $\text{Ph} - \text{C}_6\text{H}_4 - \text{C}_6\text{H}_{11}$	(r) Coupling reaction
(D) $\text{Ph} - \text{C}(\text{OH})(\text{Me})_2$	(s) Racemic mixture
	(t) Carbocation intermediate

ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 29

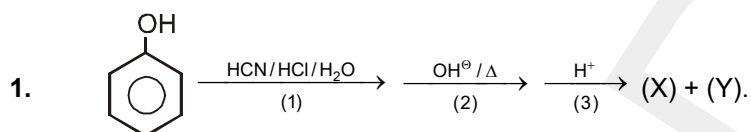
Total Marks : 30

Max. Time : 31 min.

Topic : Carboxylic Acids

Type of Questions

Type of Questions	M.M., Min.
Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks 3 min.) [12, 12]
Fill in the Blanks ('-1' negative marking) Q.5	(3 marks 3 min.) [3, 3]
Comprehension ('-1' negative marking) Q.6 to Q.8	(3 marks 3 min.) [9, 9]
Subjective Questions ('-1' negative marking) Q.9	(4 marks 5 min.) [4, 5]

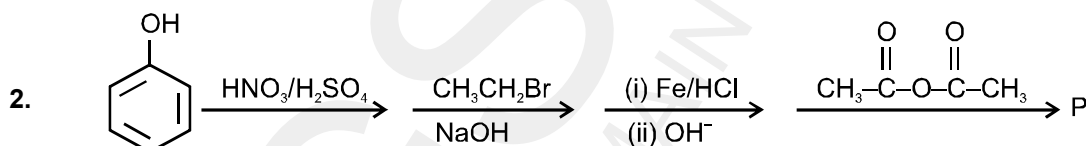


X gives white turbidity with Lucas reagent instantly.

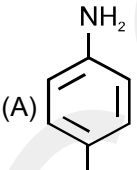
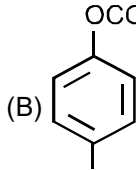
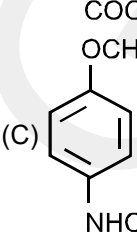
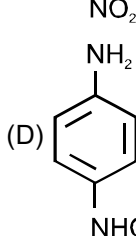
X, Y both turn blue litmus solution red.

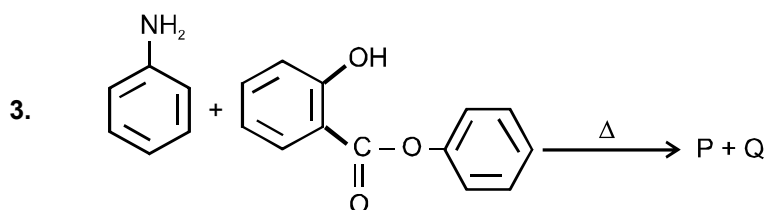
'Y' can be :

- (A) p-Hydroxy benzoic acid (B) p-Hydroxybenzaldehyde
 (C) m-Hydroxy benzoic acid (D) p-Hydroxy benzyl alcohol



Product P is phenacetin (an analgesic). Its structure will be :

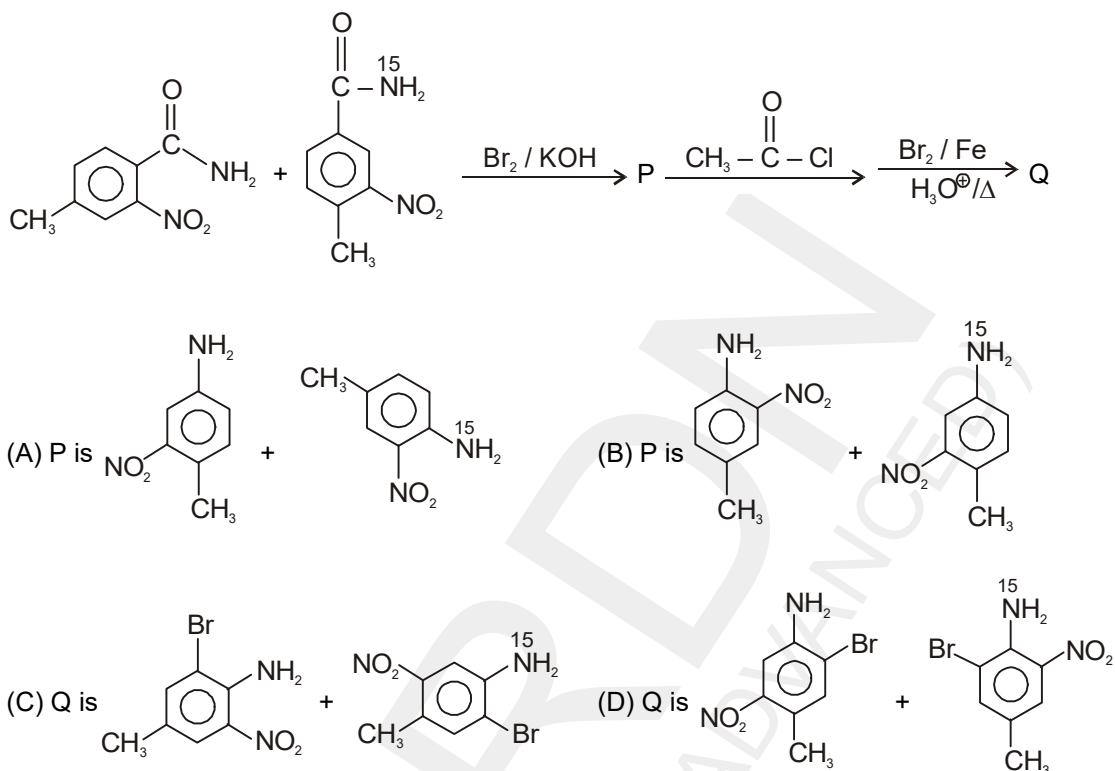
- (A)  (B) 
 (C)  (D) 



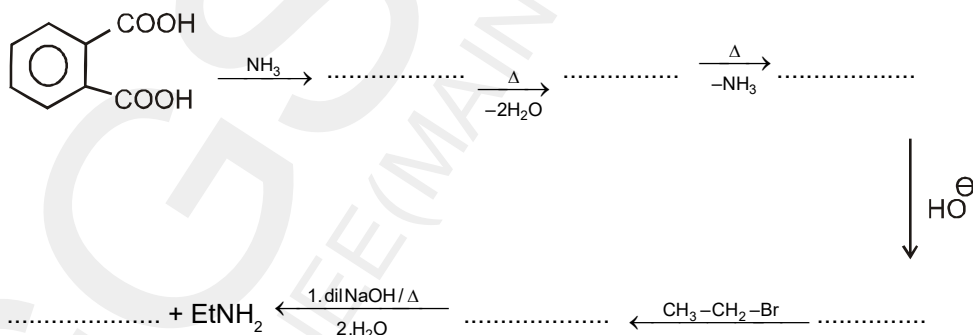
Correct statement(s) is/are -

- (A) P is an acid (B) Q is Phenol
 (C) P is an amide (D) Q is a hydroxy acid

4. The correct option for products P and Q in the following sequence of reaction is / are

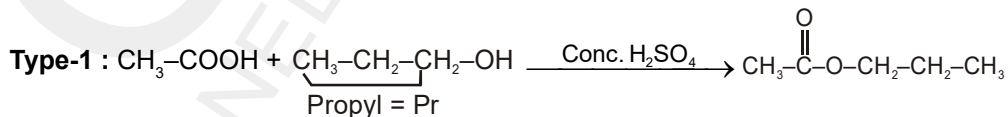


5. Fill in the blanks

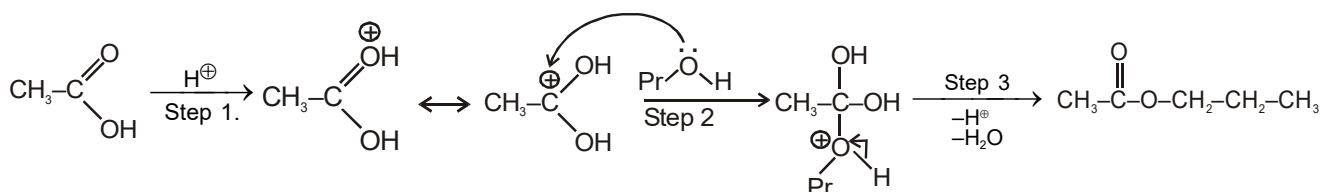


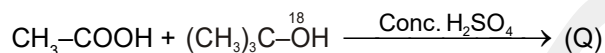
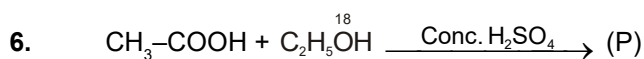
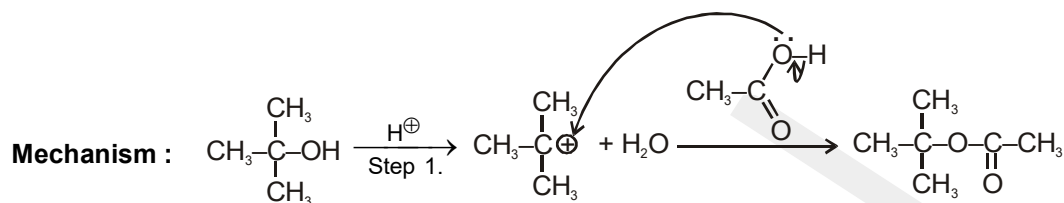
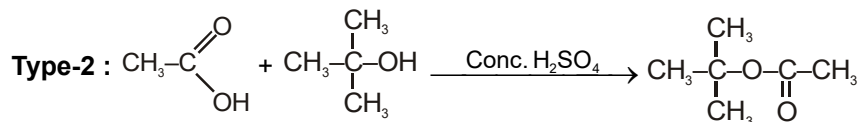
Comprehension # (Q.6 to 8)

Observe the esterification mechanisms for primary and tertiary alcohols.

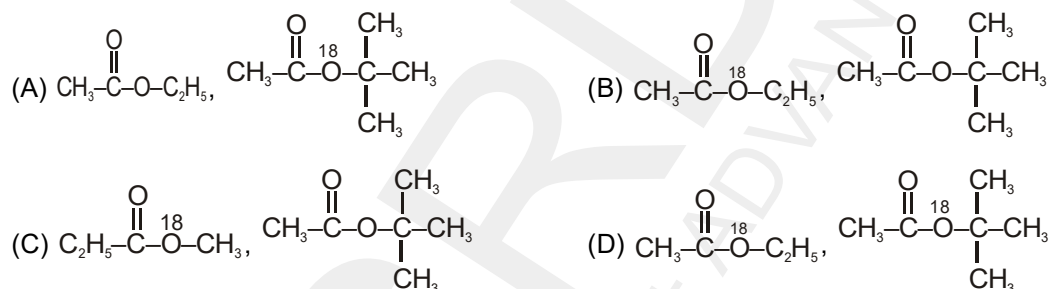


Mechanism :





In the above reaction (P) and (Q) are respectively :



7. In type I and II mechanism RDS respectively is

- (A) Step I and step II (B) Step II and step I
 (C) Step I and step I (D) Step III and step II

8. In step I of the type I mechanism and step II of the type II mechanism, the molecule of carboxylic acid behaves respectively as

- (A) Acid and acid (B) Base and base
 (C) Acid and base (D) Base and acid

9. An organic compound (A) ($\text{C}_{18}\text{H}_{20}\text{O}$) on ozonolysis gives two aromatic compounds (B) $\text{C}_{10}\text{H}_{12}\text{O}$ and (C) $\text{C}_8\text{H}_8\text{O}_2$. (C) on mild oxidation followed by treating with HI produces p-hydroxybenzoic acid and methyl iodide. (B) gives positive iodoform test and produces an oxime (D) $\text{C}_{10}\text{H}_{13}\text{ON}$ on treating with NH_2OH . (D) undergoes rearrangement in acidic media to give (E) which on acid hydrolysis gives (F) along with a monobasic acid of molecular mass 60. (F) on treating with NaNO_2 , HCl followed by oxidation and heating forms anhydride G. Assign structures from A to G with proper reasoning.

Topic : Biomolecules and Polymers

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.10

(3 marks 3 min.)

M.M., Min.

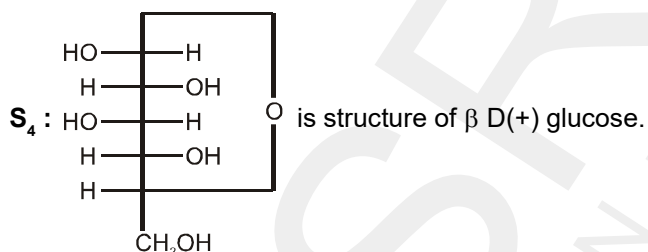
[30,30]

Match the Following (no negative marking) Q.11

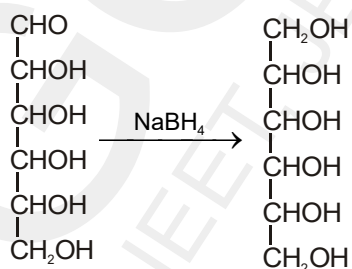
(8 marks 10 min.)

[8, 10]

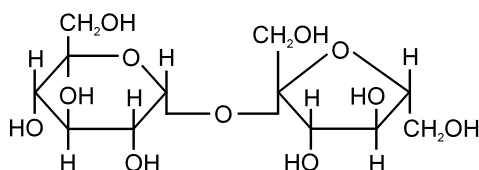
- Sugar (sucrose) is dextrorotatory (+66.5°) but the invert sugar is laevorotatory (-19.9°). It is due to :
 (A) Mutarotation
 (B) reducing nature of invert sugar
 (C) invert sugar is a 1 : 1 mixture of D-glucose (52.7°) and D-Fructose (-92.4°) obtained by hydrolysis of sugar.
 (D) Inversion of configuration of sucrose due to hydrolysis.
- S_1 : Sucrose has C_1-C_2 glycosidic linkage between β -D-Glucose & α -D-Fructose.
 S_2 : Glucose does gives positive test of 2, 4 DNP.
 S_3 : Pentacetate of glucose does not forms oxime.



- (A) F F T T (B) F F T F (C) F F F T (D) T T T T
- Monomer of cellulose is
 (A) Fructose (B) Maltose (C) Sucrose (D) Glucose
 - Observe the following reaction and find out that how many number of reactant stereoisomers can be reduced to optically inactive meso products.

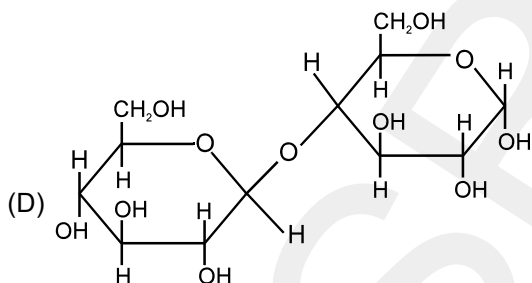
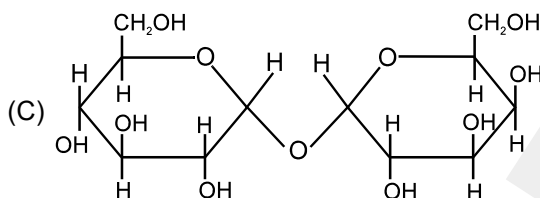
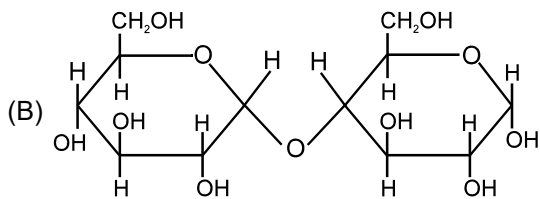
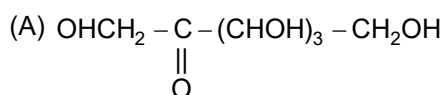


- (A) 2 (B) 4 (C) 6 (D) 8
- The following compound on hydrolysis will give



- (A) A pair of anomers (B) A pair of enantiomers
 (C) A pair of epimers (D) A pair of molecules having common tautomer

6. Which of the following is a nonreducing sugar ?



7. Find true and False from the following statements regarding carbohydrates

S₁ : Cellulose is a reducing sugar.

S₂ : Sucrose is an oligo sachharide.

S₃ : A pair of diastereomeric aldoses which differ only in configuration at C-2 are anomers.

S₄ : Osazone formation destroys the configuration at C-2 of an aldose, but does not affect the configuration of the rest of the molecule.

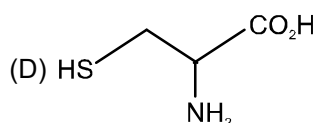
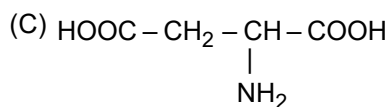
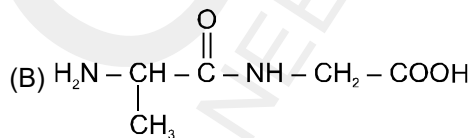
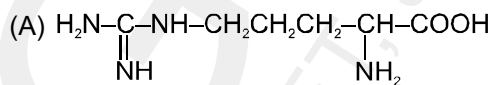
(A) TTTT

(B) TFTF

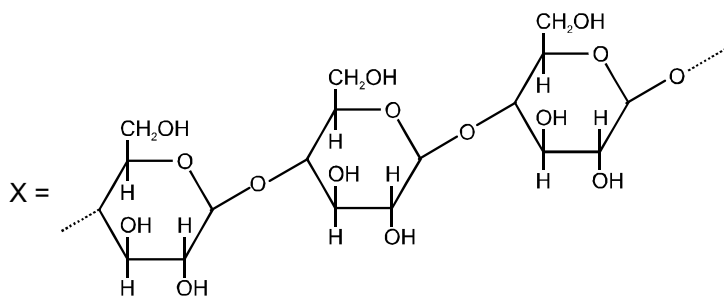
(C) FTFT

(D) FTTT

8. Which of the following amino acid is most basic :



9.* The correct statement(s) about biopolymer X is(are) :



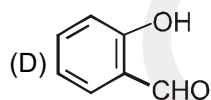
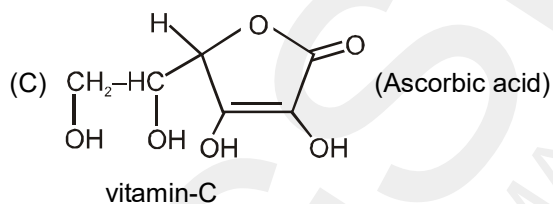
- (A) It is a non-reducing sugar. (B) It exhibits mutarotation.
 (C) It has $\beta(C_1 - C_4)$ glycosidic linkage. (D) Its hydrolysis product is D-Galactose.

10.* The correct statements about peptides are

- (A) A dipeptide has one peptide link between two amino acids.
 (B) By convention N-Terminus is kept at left and C-terminus at right in the structure of a peptide
 (C) If only one amino group and one carboxylic acid, group are available for reaction, then only one dipeptide can form.
 (D) A polypeptide with more than hundred amino acid residues (mol. mass > 10,000) is called a protein

11. **Column-I**

- (A) D-Glucose
 (B) D-(+)Glyceraldehyde (Aldotriose)



- (E) 1,3-Dihydroxy propanone (Ketotriose)

Column-II

- (p) HIO_4 oxidation
 (q) $NaBH_4$ Reduction
 (r) Tollen's test positive
 (s) Readily water soluble

ORGANIC CHEMISTRY

DPP
 DAILY PRACTICE PROBLEMS

DPP No. 31

Total Marks : 35

Max. Time : 37 min.

Topic : Hydrocarbon

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks 3 min.)

M.M., Min.

[18, 18]

Comprehension ('-1' negative marking) Q.7 to Q.9

(3 marks 3 min.)

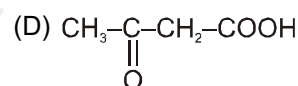
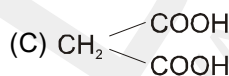
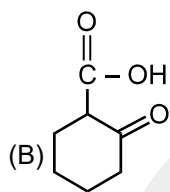
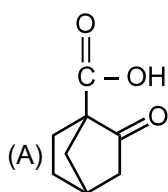
[9, 9]

Match the Following (no negative marking) Q. 10

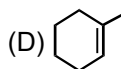
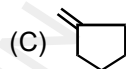
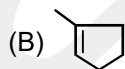
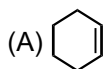
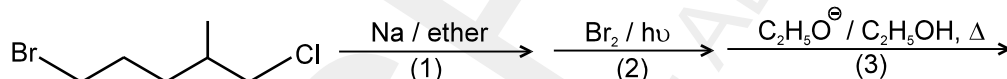
(8 marks 10 min.)

[8, 10]

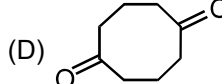
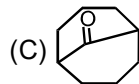
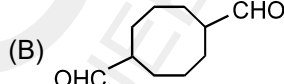
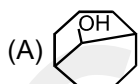
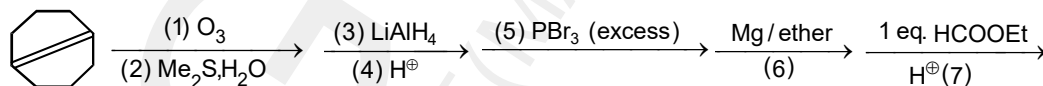
1. Which acid will not decarboxylate on heating.



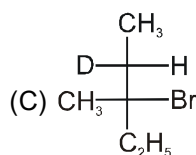
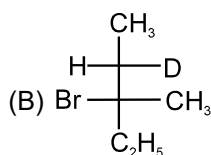
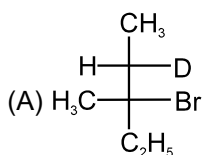
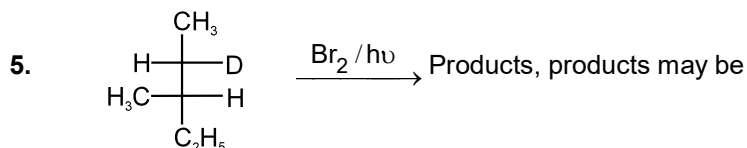
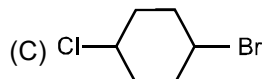
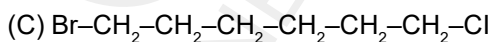
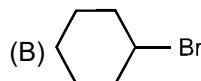
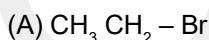
2. The major product of the following reaction is :



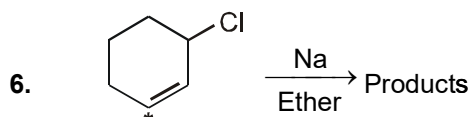
3. The end product of following reaction is



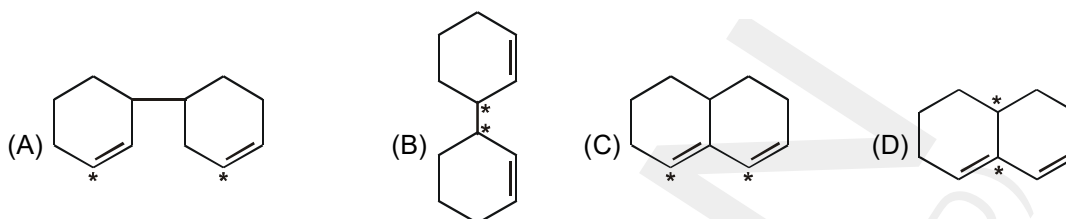
4. Which of the following will form cyclohexane on reaction with two moles of Na in ether.



(D) Both A and B

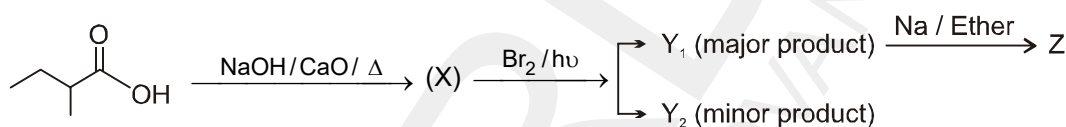


Which of the following is / are the possible product/s



Comprehension # (Q. No. 7 to 9)

Observe the following sequence of reactions.



7. Identify 'X'



8. The no. of major product/s (Y_1) and number of minor product/s (Y_2) will be respectively (include stereoisomers)

- (A) 2, 2 (B) 2, 1 (C) 1, 3 (D) 1, 2

9. The structure of Z (obtained from major product Y_1) will be



10. **Column-I**

- (A) Bakelite
 (B) Dacron
 (C) Nylon-66
 (D) Buna-S

Column-II

- (p) Butadiene and styrene
 (q) Phenol and methanal
 (r) 1,2-dihydroxyethane and dimethyl terephthalate
 (s) 1,6-hexanedioic acid and 1,6-diamine hexane

Topic : Hydrocarbon

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.6

(3 marks 3 min.)

M.M., Min.

[18, 18]

Comprehension ('-1' negative marking) Q.7 to Q.9

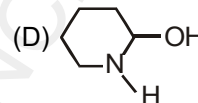
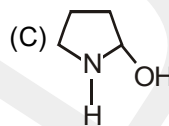
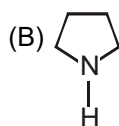
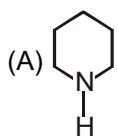
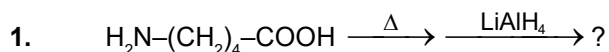
(3 marks 3 min.)

[9, 9]

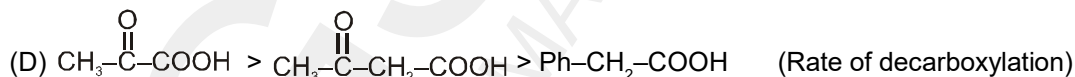
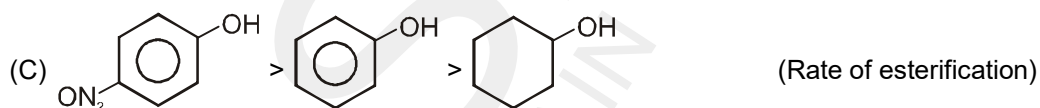
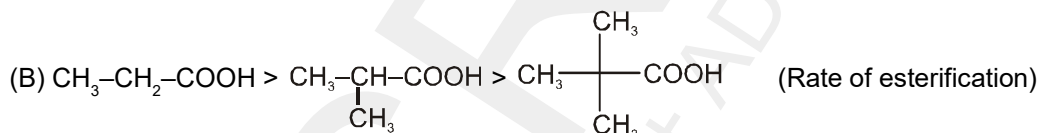
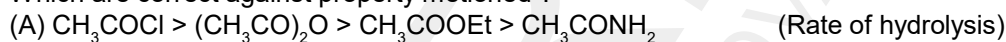
Subjective Questions ('-1' negative marking) Q.10

(4 marks 5 min.)

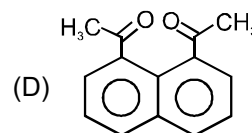
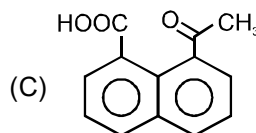
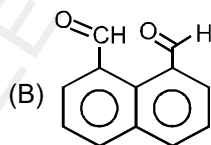
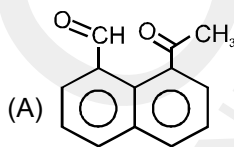
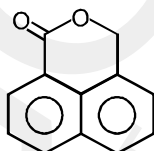
[4, 5]



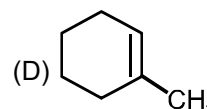
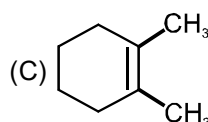
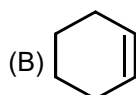
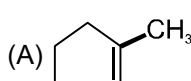
2. Which are correct against property mentioned ?



3. Which of the following reagent on reaction with conc. NaOH followed by H^+ gives following cyclic ester.



4. Hydrocarbon (X) on ozonolysis followed by treating with Zn-dust and water gives (Y) which on heating with alkali gives 1-acetyl cyclopentene. The structure of (X) is :



5. Isobutyl alcohol and secondary butyl alcohol can be distinguished by.

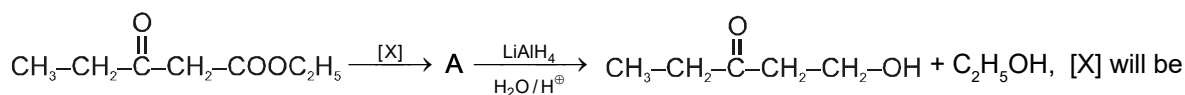
(A) Oxidation with alkaline KMnO_4 & tollen's reagent.

(B) Oxidation with acidic dichromate & tollen's reagent

(C) Oxidation by heating with copper followed by reaction with I_2 / OH^- .

(D) Oxidation by concentrated H_2SO_4 followed by reaction with fehling solution.

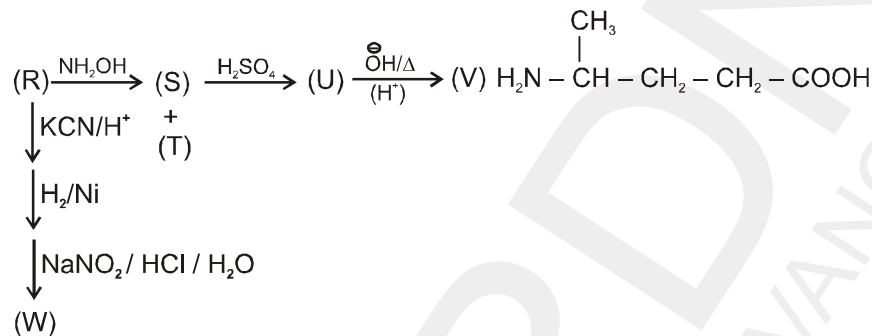
6. In the given reaction



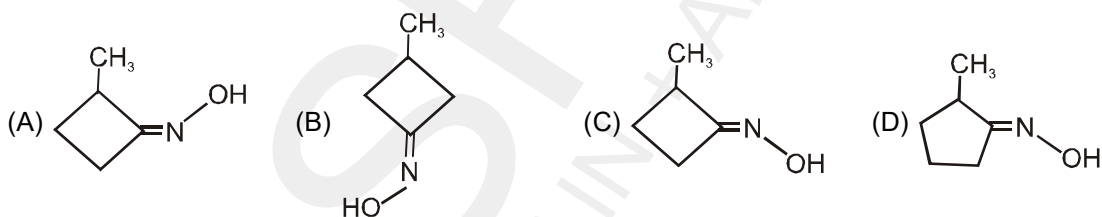
- (A) HCN (B) $\begin{array}{c} \text{CH}_2\text{-OH} \\ | \\ \text{CH}_2\text{-OH} \end{array} + \text{OH}^\ominus$ (C) HCHO (D) $\text{CH}_2 \begin{array}{l} \text{CH}_2\text{-SH} \\ \text{CH}_2\text{-SH} \end{array} + \text{H}^\oplus$

Comprehension # (Q.7 to 9)

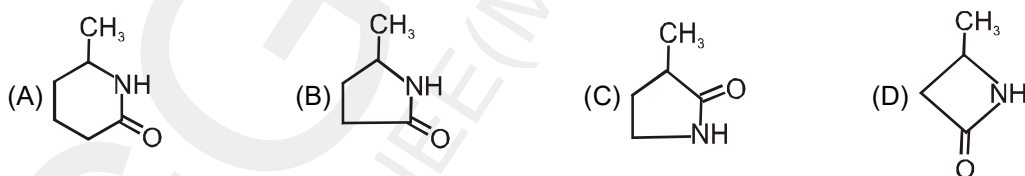
Answer the questions on the basis of following observations



7. The compound (S) is :



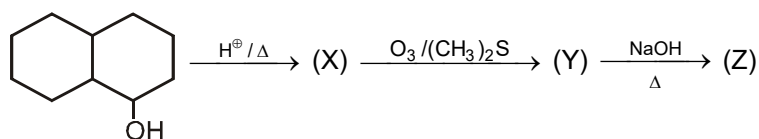
8. The compound U is :



9. The compound W is :



10.



Identify X, Y and Z.



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ORGANIC CHEMISTRY

DPP

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ORGANIC CHEMISTRY

DPP No. # 1

1. (A) 2. (A) 3. (A) 4. (C) 5.* (ABD)
6.* (AC) 7. (A) 8. (C) 9. (ii), (iv) & (vi) are non polar.

DPP No. # 2

1. (C) 2. (D) 3. (C) 4. (A) 5.* (ACD)
6.* (ABC) 7. 4 8. (A - p,q,t) ; (B - p,q,s) ; (C - p) ; (D - p,q,r,s)

DPP No. # 3

1. (B) 2. (C) 3. (B) 4. (D) 5. (B,C)
6. (A,C,D) 7. (B) 8. (C) 9. (A) 10. 2

DPP No. # 4

1. (B) 2. (D) 3. (B) 4. (C) 5.* (ABD)
6.* (AB) 7. 7 8. (A → p, q), (B → p), (C → p, q, r, s), (D → p, r).

DPP No. # 5

1. (A) 2. (B) 3. (B) 4. (D) 5. (A,C,D)
6. (A,B) 7. 7 8. (A - p,s) ; (B - p,s) ; (C - p,s) ; (D - q)

DPP No. # 6

1. (C) 2. (D) 3. (D) 4. (D) 5. (C)
6. (ACD) 7. (BCD) 8. 6 9. (A - s) ; (B - r) ; (C - q) ; (D - p)

DPP No. # 7

1. (A) 2. (C) 3. (B) 4. (C) 5.* (ABD)
6.* (ABC) 7. 7 8. (A) - (p, q, r) ; (B) - (p, q, r, s, t) ; (C) - (p, q, r) ; (D) - (p, s)

DPP No. # 8

1. (A) 2. (A) 3. (C) 4. (A) 5. (D)
6. (D) 7. (D) 8. (A) 9. (A)
10. (A → r) ; (B → s) ; (C → q) ; (D → p)

DPP No. # 9

1. (A) 2. (D) 3. (A) 4. (D) 5. (C)
6. (A) 7. II > I > III 8. 4

DPP No. # 10

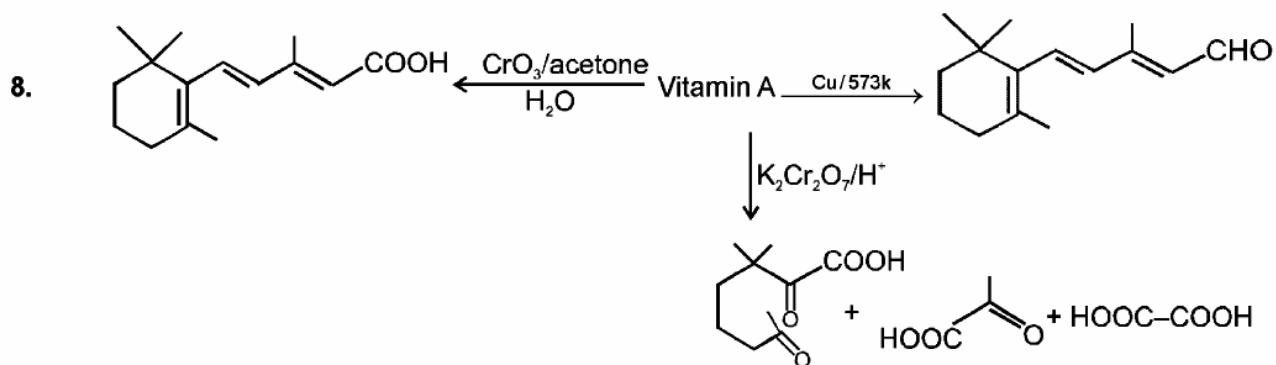
1. (D) 2. (C) 3. (B) 4. (B) 5. (D)
6. (C) 7. True 8. True
9. Enol of second is antiaromatic. 11. Molecular weight = [103]

DPP No. # 11

1. (A) 2. (A) 3. (B) 4. (B) 5. (A)
 6. (D) 7. t-Butyl group hinders protonated pyridine for hydration.
 8. (a) True (b) True (c) True

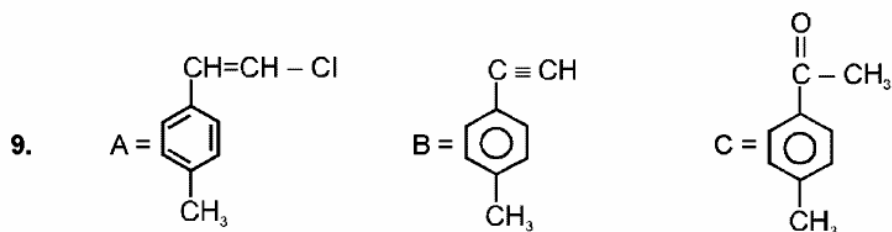
DPP No. # 12

1. (B) 2. (A) 3. (C) 4. (D) 5. (B)
 6. (A) 7.* (A,B,D)



DPP No. # 13

1. (D) 2. (B) 3. (D) 5. (D) 6. (B)
 7. (A) 8. (A)

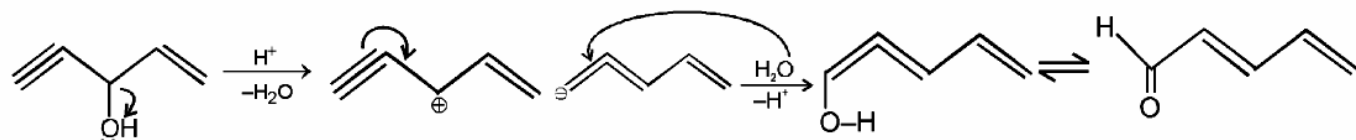


DPP No. # 14

1. (C) 2. (B) 3. (C) 4. (C) 5. (A)
 6. (C) 7. (A) 8. True

DPP No. # 15


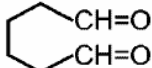
1. (D) 2. (B) 3. (B) 4.* (B, C) 5. (C)
 6. (D) 7. (D) 8. True
 9.



DPP No. # 16

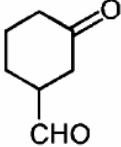
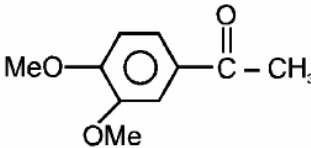
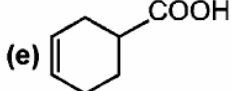
1. (A) 2. (B) 3. (D) 4. (C) 5. (C)
 6. (B,D) 7. (B,C) 8. (A,B,C) 9. True

DPP No. # 17

1. (D) 2. (C) 3. (C) 4. (A,D) 5. (B,D)
 6. True
 7. (i) $\text{Me}_2\text{C}=\text{O} + \text{EtCH}=\text{O}$ (ii) $\text{MeCOOH} + \text{MeCH}=\text{O}$
 (iii)  + MeCOOH (iv) 
 (v) No reaction as the diol is trans and rotation is restricted. (vi) No reaction for 1, 3-diol.

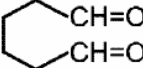
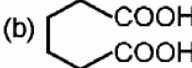
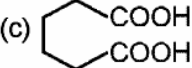
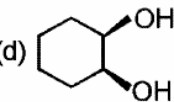
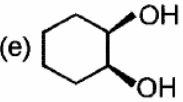
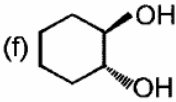
DPP No. # 18

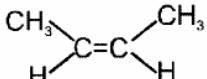
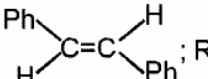
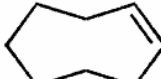
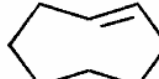
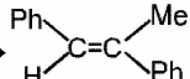
1. (B) 2. (A) 3. (D) 4.* (A,C) 5.* (A,C)
 6. (A → r) ; (B → s) ; (C → q) ; (D → p)

7. (a) $(\text{C}_2\text{H}_5)_2\text{C}(\text{CH}_3)-\text{CHO}$ (b)  (c) $\text{Ph}-\text{CH}=\text{CH}-\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{CHO}$
 (d)  (e)  (f) $\text{CH}_3-\text{CH}_2-\text{COOH}$

DPP No. # 19

1. (D) 2. (D) 3. (C) 4*. (A,B,D)
 5. (A - p,s); (B - p,q,s); (C - q,r); (D - p,s). 6. Polar (a, c, e, f, h) ; Non-polar (b, d, g)

7. (a)  (b)  (c)  (d) 
 (e)  (f) 

8. P →  ; Q →  ; R →  ; S →  ; T → 

DPP No. # 20

1. (C) 2. (B) 3. (D) 4. (D) 5. (B,D)
 6. (a) True (b) False 7. (D) 8. (A) 9. (C)
 10. (iii) Yes, Yes (iv) Yes, Yes (v) Yes, No (vi) Yes, Yes
 (vii) Yes, No (viii) Yes, No (ix) Yes, No (x) No, No

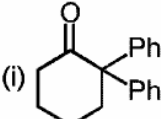

DPP No. # 21

1. (D) 2. (B) 3. (C) 4. (A) 5. (A)
- 6.* (BC) 7. False 8. (a) (A) (b) (C) (c) (C)
9. Lucas reagent is used to distinguish primary, secondary and tertiary alcohol.
- $$R-OH + HCl \xrightarrow{ZnCl_2} R-Cl \text{ (white ppt.)} + H_2O$$
- 3° Alcohol → Instant turbidity
 2° Alcohol → After 5 minute turbidity appear.
 1° Alcohol → After 30 minute turbidity appear.

DPP No. # 22

1. (D) 2. (C) 3. (B) 4. (A,C,D) 5*. (A,B,C,D)
- 6*. (A,B,C,D) 7. True 8. (A → t) ; (B → p,r) ; (C → p) ; (D → s)
9. The better yield will be obtained by using the secondary halide, 1-bromo-1-phenylthane, because the desired reaction is E2.

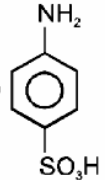
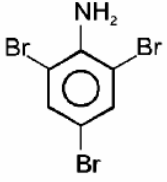
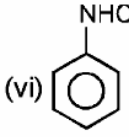
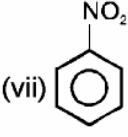
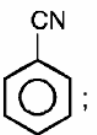
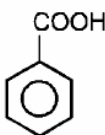
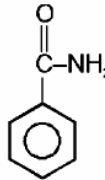
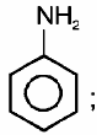
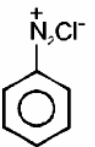
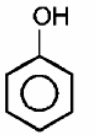
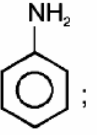
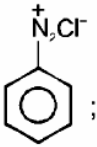

DPP No. # 23

1. (A) 2. (D) 3. (C) 4*. (ABCD)
5. (i)  ; (ii)  6. 8 7. (B) 8. (A) 9. (C)

DPP No. # 24

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

DPP No. # 25

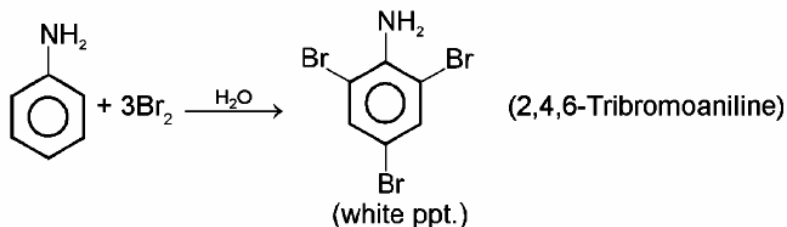
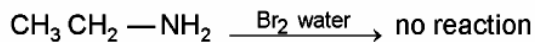
1. (C) 2. (B) 3. (B)
4. (a). (i) $C_6H_5NC + KCl + H_2O$ (ii) $C_6H_6 + N_2 + H_3PO_3 + HCl$ (iii) 
- (iv) $C_6H_6 + N_2 + CH_3CHO + HCl$ (v)  (vi)  (vii) 
- (b). (i) A =  ; B =  ; C = 
- (ii) A =  ; B =  ; C = 
- (iii) A =  ; B =  ; C = 

DPP No. # 26

1. (A) 2. (C) 3. (D) 4. (B) 5. (C)
 6. (B) 7. (B)

8. (a)

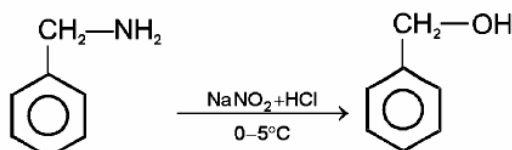
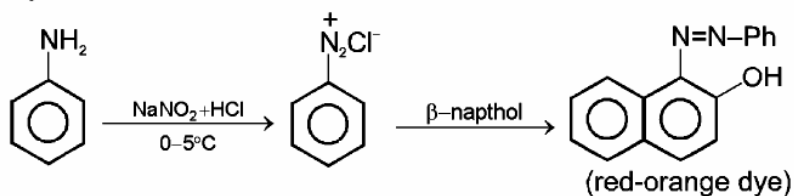
(i) With $\text{Br}_2/\text{H}_2\text{O}$:



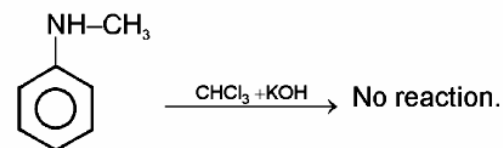
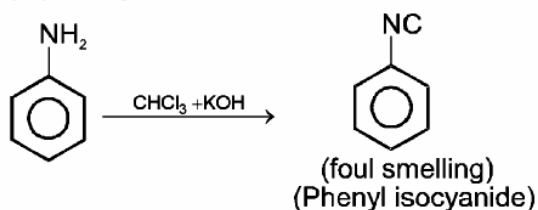
(ii) With $\text{Br}_2/\text{H}_2\text{O}$:

Aniline give white ppt. of 2,4,6-tribromoaniline while benzyl aniline give ortho & para bromo benzyl aniline or

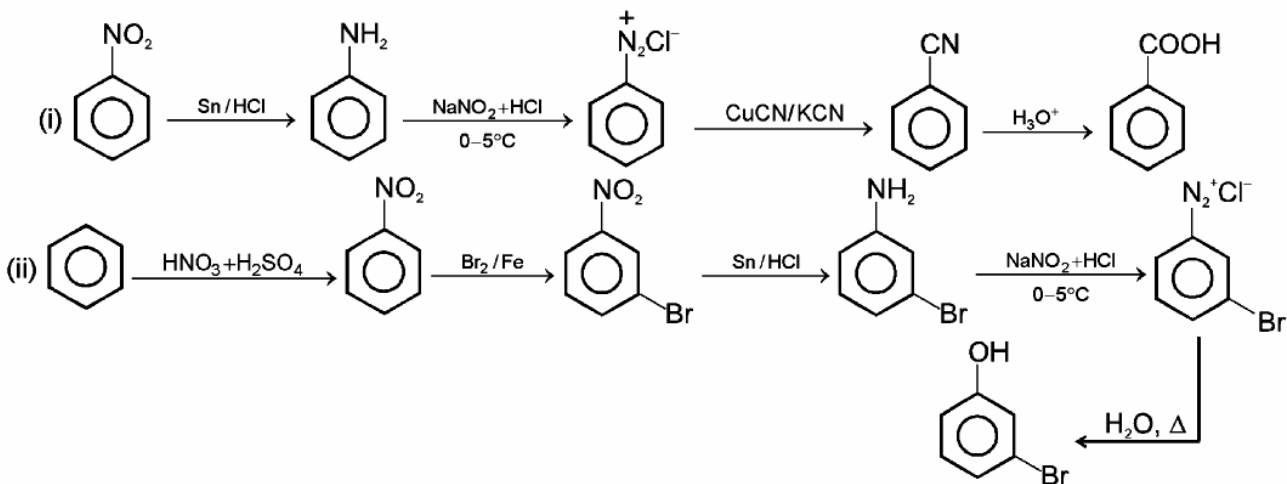
Dye test :

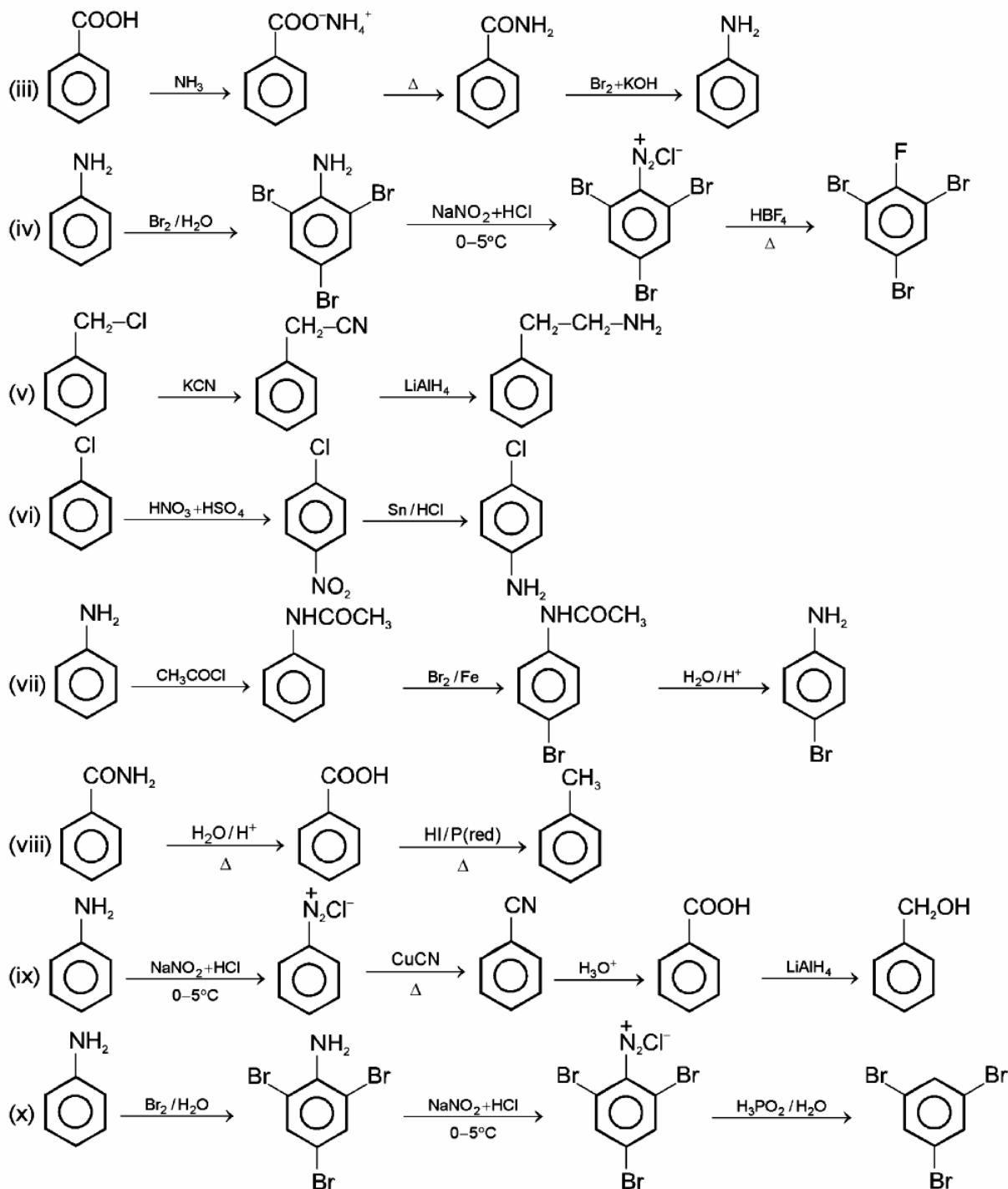


(iii) Carbylamine test :



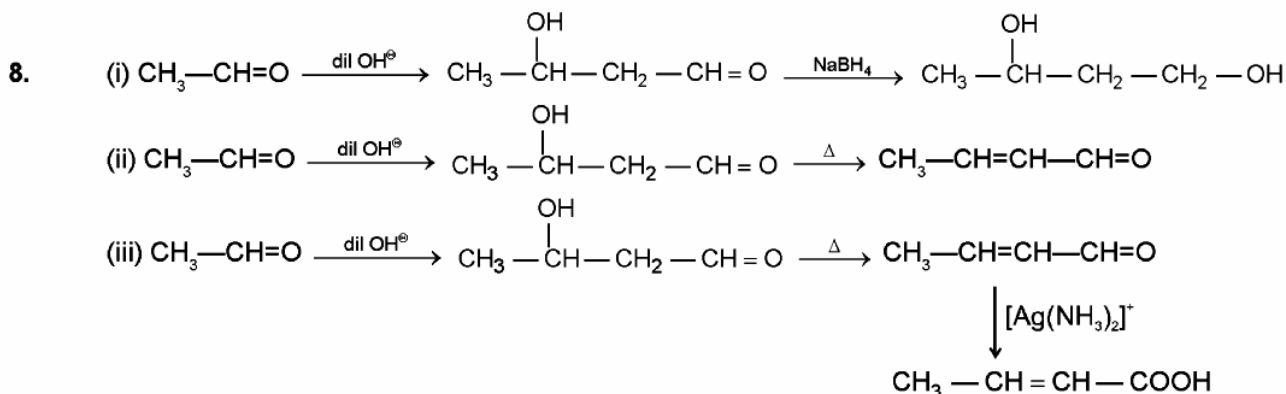
(b).





DPP No. # 27

1. (D) 2. (B) 3.* (C) 4. (A) 5. (B)
 6. (A) 7. (A \rightarrow p ; q) ; (B \rightarrow p, q) ; (C \rightarrow r) ; (D \rightarrow s)

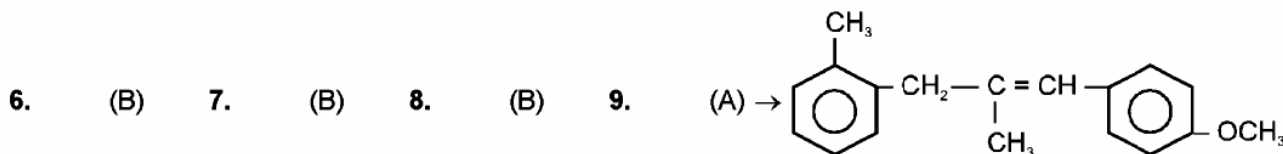
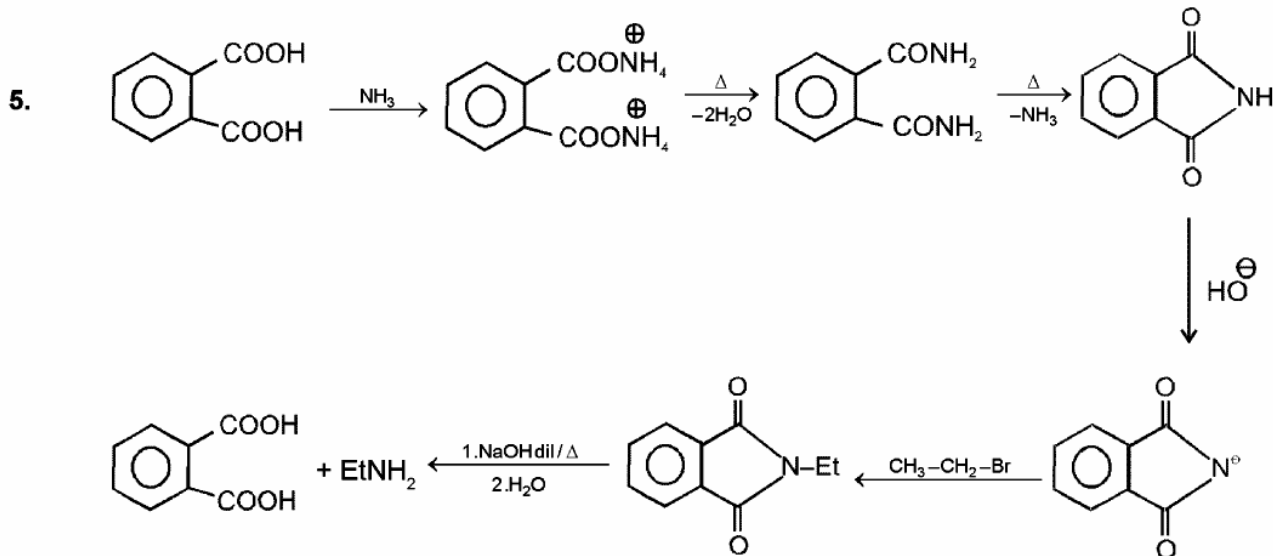


DPP No. # 28

1. (D) 2. (B) 3. (A) 4. (B) 5. (C)
 6. (A) 7. True 8. 07 9. (A - q, t) (B - p, r) (C - p, s, t) (D - q, s)

DPP No. # 29

1. (A) 2. (C) 3.* (BC) 4.* (BC)



DPP No. # 30

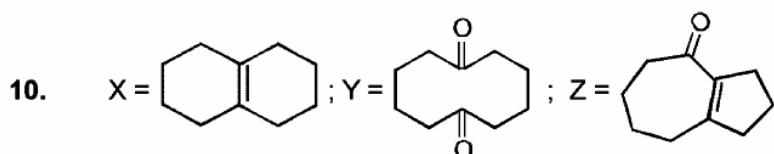
1. (C) 2. (A) 3. (D) 4. (B) 5. (D)
 6. (C) 7. (C) 8. (A) 9.* (AC)
 10.* (ABCD) 11. (A) - (p, q, r, s) ; (B) - (p, q, r, s) ; (C) - (p, s) ; (D) - (q, r) ; (E) - (p, q, r, s)

DPP No. # 31

1. (A) 2. (B) 3. (A) 4. (C) 5. (D)
 6.* (AB) 7. (C) 8. (B) 9. (A)
 10. (A - q) ; (B - r) ; (C - s) ; (D - p)

DPP No. # 32

1. (A) 2.* (AB) 3. (B) 4. (D) 5. (C)
 6. (D) 7. (C) 8. (B) 9. (D)



Hints and Solutions

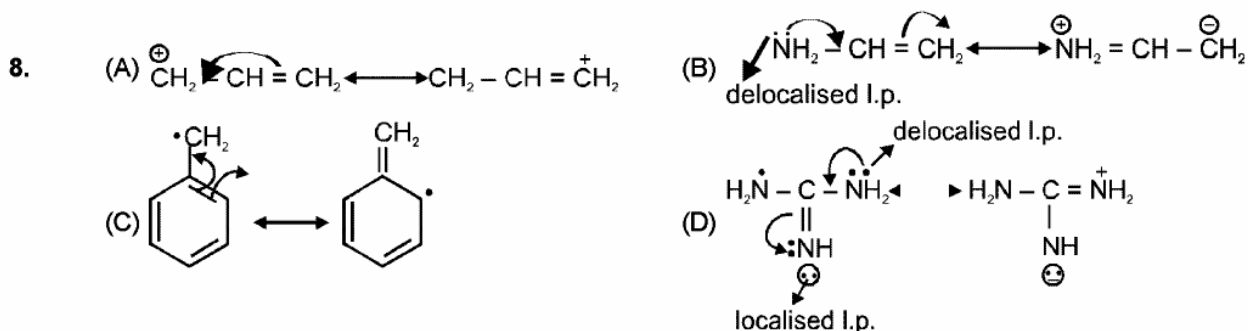
ORGANIC CHEMISTRY

DPP No. # 1

- Case A has incorrect direction of I-effect.
- (ii), (iv) & (vi) are non polar.

DPP No. # 2

- Nitrogen does not have vacant d-orbital, so cannot form five bonds.
- In (A) negative charge and lone pair on adjacent position.
- Self explanatory.
- (i), (v), (vi), (vii) only



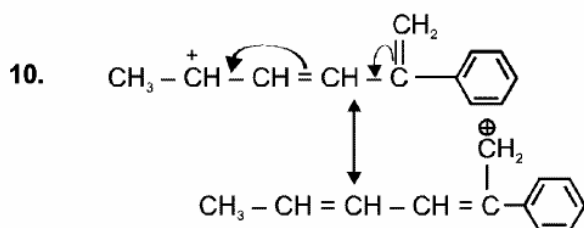
DPP No. # 3

- The resonance energy of fused system increases as the number of principal canonical forms increases.

R.E.	p	q	r	s
(K cal/mole) = 36	61	84	92	

In 'S' more number of canonical forms have stable kekule arrangement of 6π electrons in all the three rings as compared to anthracene.

- $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2$ has two α -hydrogen for hyperconjugation.
- Lone pair of electrons of $\text{H}_2\text{C} = \dot{\text{N}} - \text{CH}_3$ is in sp^2 hybrid orbital.

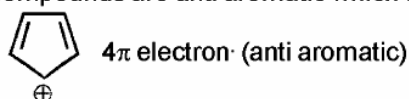


DPP No. # 4

- Due to H.C. bond length decreases.

DPP No. # 5

- In compound (A) due to SIR benzene ring has least π -electron density while in compound (C) +M of $-\text{NH}_2$ group makes aromatic ring most electron rich.
- Those compounds are anti aromatic which are cyclic, planar having $4n$ π electrons:



- On the basis of electronic effect.
- Phenol prefer coupling in slightly basic medium.
- 7 including the given structure in which every C will receive a positive charge.

DPP No. # 8

- On the basis of I effect.
- On the basis of I effect.
- I effect increases the acidic strength and depends upon distance.
- Due to ortho effect ortho substituted benzoic acid is stronger acid than other.
- $K_a \propto$ stability of conjugate base \propto (-I, -M groups).
- SO₃H functional group will have maximum acidic strength. Then, in (II), acidity is increased due to SIR effect.
- Acid strength order is
p-chlorobenzoic acid > benzoic acid > p-toluic acid > p-methoxy benzoic acid.

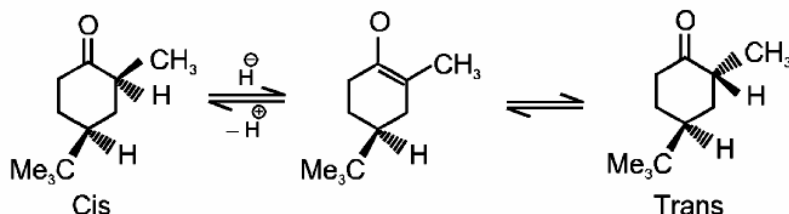
DPP No. # 9

- (D) $-\text{NO}_2 \rightarrow -M > -I$; $-\text{CH}_3 \rightarrow \text{H.C. and } +I$
In phenol, No ortho effect.
- I effect \uparrow Basic strength \downarrow .

DPP No. # 10

- Acidic strength order is $-\text{SO}_3\text{H} > \text{COOH} > -\text{CH}_2-\text{NO}_2 > -\text{CH}_2\text{CHO}$
- $$\begin{array}{ccc} \text{CH}_2 = \text{CH} - \text{Cl} & \text{CH}_2^+ - \text{CH} = \text{Cl}^- & \text{CH}_2^- - \text{CH} = \text{Cl}^+ \\ \text{(I)} & \text{(II)} & \text{(III)} \end{array}$$

non polar st. octet of carbon is incomplete octet of carbon is complete
- Oxygen is more electronegative than nitrogen hence stabilises the carboxylate anion better.
- Enol of second is antiaromatic.
- Because of enolisation



- $$\begin{array}{c} \text{O} \quad \text{H} \quad \text{O} \\ \parallel \quad | \quad \parallel \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{OCH}_3 \\ \quad \quad | \\ \quad \quad \text{D} \end{array}$$

Molecular weight = [103]

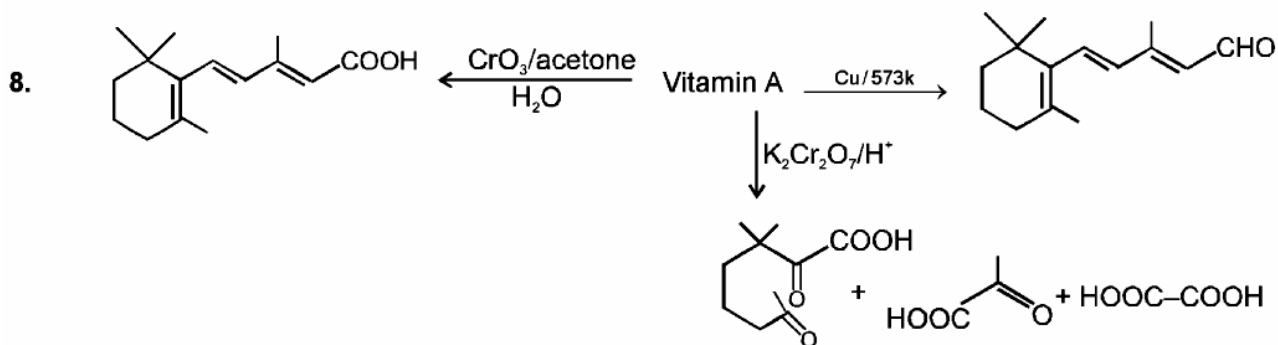
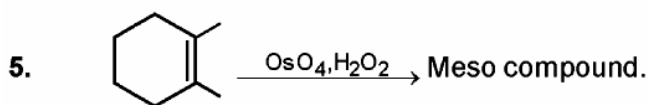
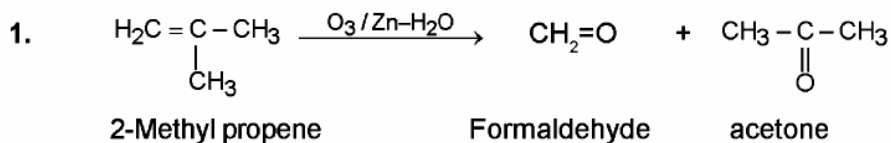
DPP No. # 11

- t-Butyl group hinders protonated pyridine for hydration.
- (a) In (I) lone pair of N is delocalised but not in (II). After protonation of (I) positive charge cannot participate in resonance (follow octet rule)

(b) This is due to steric inhibition of resonance in former which does not appear in the later.

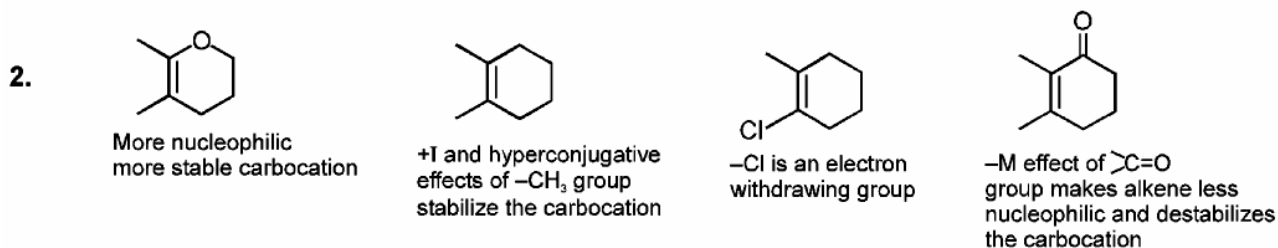
(c) In the former steric inhibition or resonance causes the availability of lp on N whereas in the later due to H-bonding of NH₂ with NO₂ groups make NH₂ planar with benzene ring, so easy delocalisation of electron pair of N in benzene ring.

DPP No. # 12

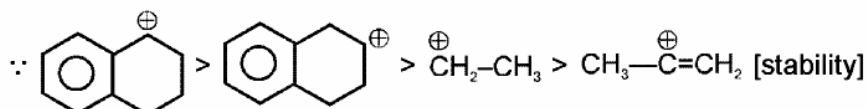


DPP No. # 13

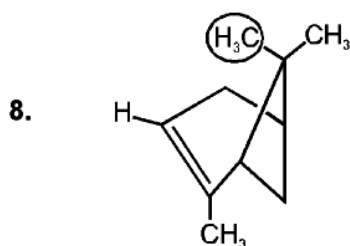
1. Electron releasing group and stability of carbocation will decide rate of reaction in electrophilic addition reaction.




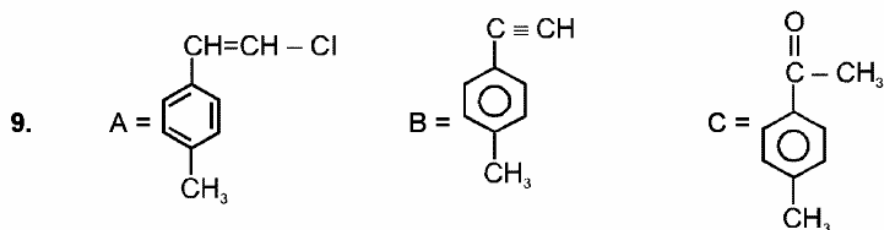
3. Rate of electrophilic addition reaction \propto stability of C^+ produced



6. Conceptual

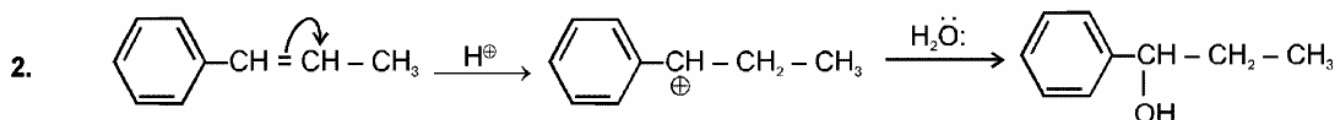


 methyl group shields top face, and bottom face of α -pinene is less hindered hence hydroboration of α -pinene is observed to be 100% stereoselective and syn addition takes place. Anti markownikove's product in case of hydroboration.



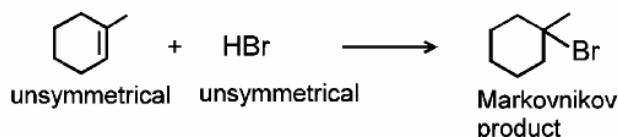
DPP No. # 14

1. As in previous question.



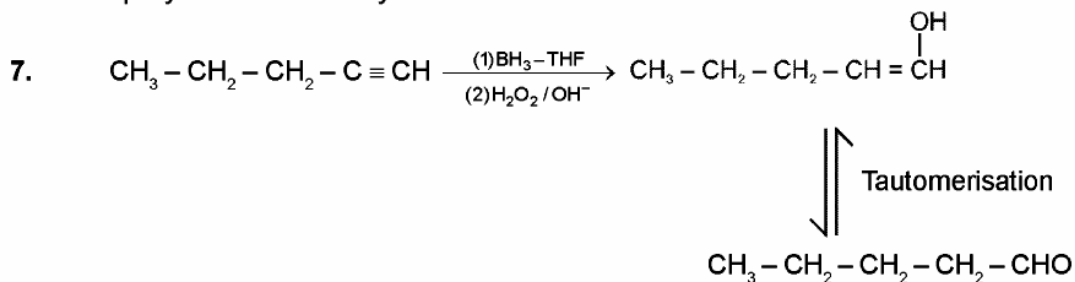
3. Addition of water by oxymercuration reduction without rearrangement.

4. Markovnikov addition is observed for unsymmetrical alkene and unsymmetrical reagent

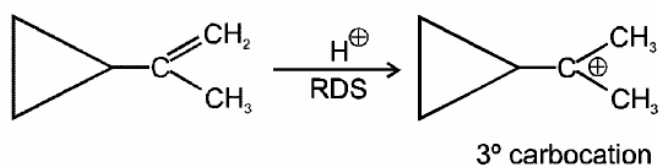


5. Alkenes are more reactive than alkynes more branched alkynes are more reactive.

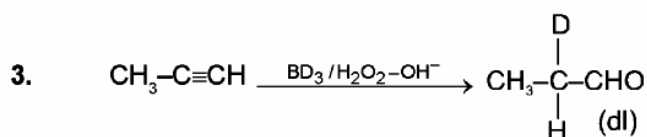
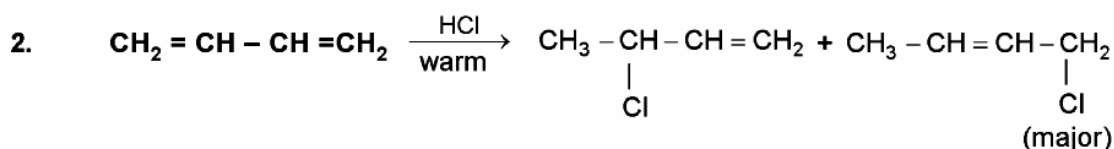
6. sp Hybridisation of alkyne and also intermediate form is less stable.



8. Alkene II gives a tertiary carbocation intermediate in rate-determining step.



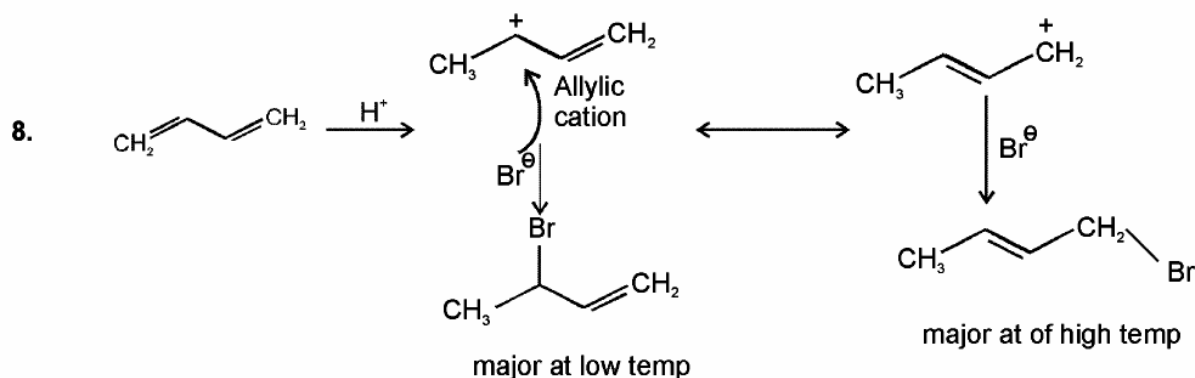
DPP No. # 15



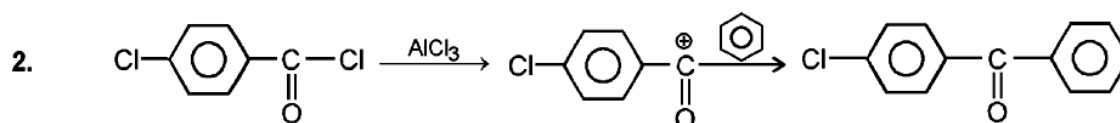
7. (a) Reason \rightarrow COOH destabilise the formed carbocation.

(b) Reason \rightarrow Due to +M effect of $-\text{OCH}_3$ group

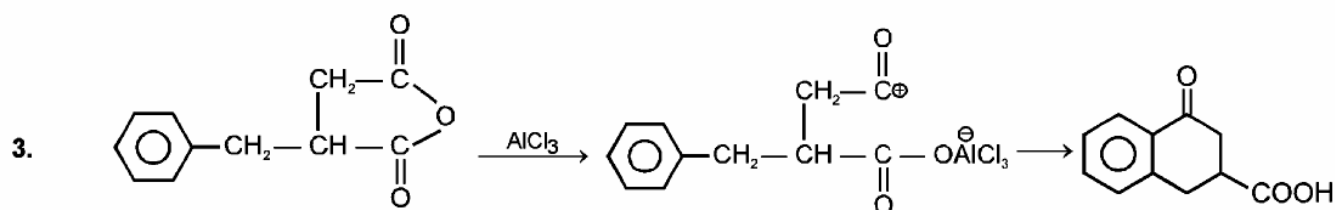
(c) Formed carbocation in (4) is less stable than (3) due to $-I > +m$ of Cl group.



DPP No. # 16



Acylation is more favourable because of resonance stabilization.

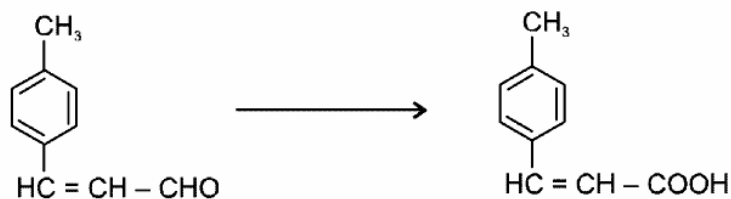


4. The + M of Cl stabilizes the intermediate carbocation.

9. Deactivating nature of halogen can be explain by - I & ortho-para directing nature can be explain by stability of intermediate by + M.

DPP No. # 17

2. Alkaline KMnO_4 (dil.) will oxidise $\text{C} = \text{C}$ also.



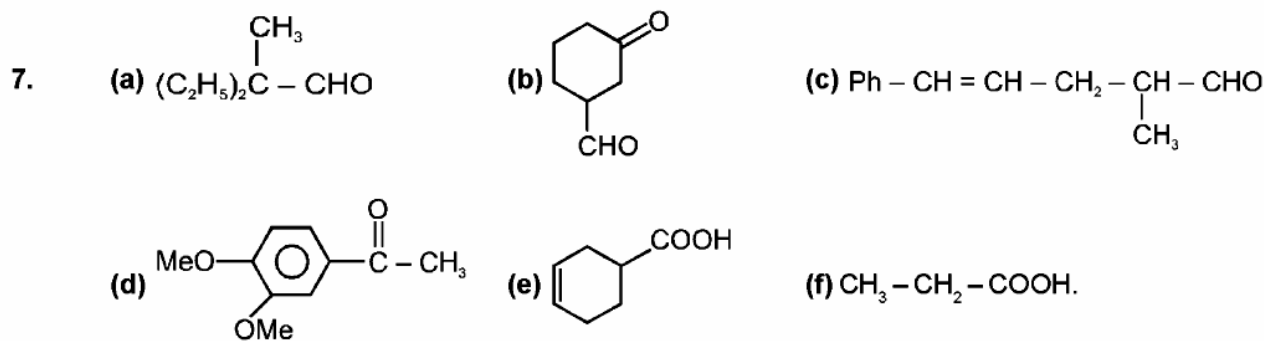
6. Phenyl chloride is very weakly ionised by AlCl_3 because Ph^+ carbocation is very less stable.

DPP No. # 18

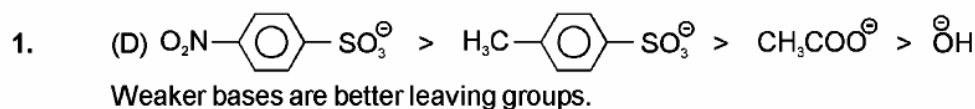
1. Electrophilic addition at $\text{C} = \text{C}$ is faster than electrophilic substitution at Benzene ring. The $\text{C} = \text{C}$ is highly e^- rich due to + m effect of OH group.

2. The electron-attracting - NO_2 stabilizes ring A of 1-nitronaphthalene to oxidation, and ring B is oxidized to form 3-nitrophthalic acid. By orbital overlap, - $\ddot{\text{N}}\text{H}_2$ releases electron density, making ring A more susceptible to oxidation, and α -naphthylamine is oxidized to phthalic acid. The NO_2 labels one ring and establishes the presence of two fused benzene rings in naphthalene.

6. E.W.G groups meta directing more.



DPP No. # 19



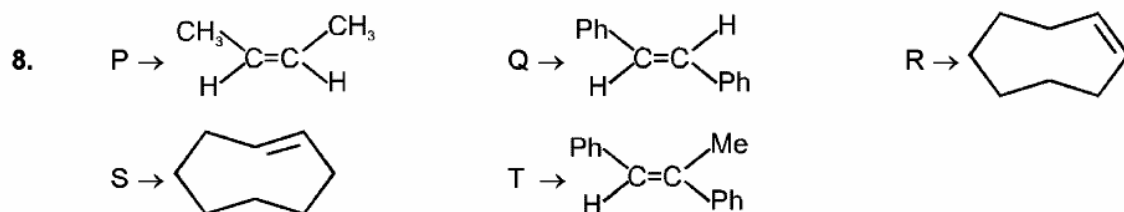
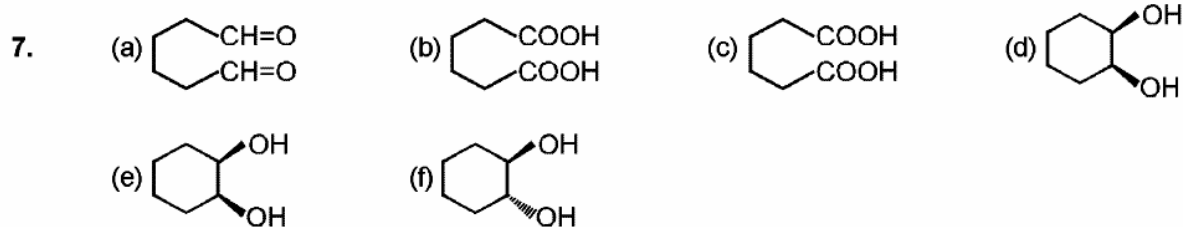
2. I^- is the strongest nucleophile as well as best leaving group.

4*. Nucleophilicity \propto Size of donor atom (in group).

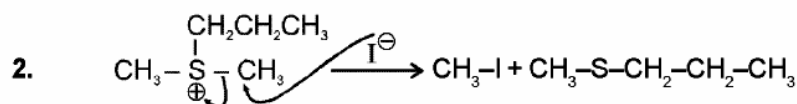
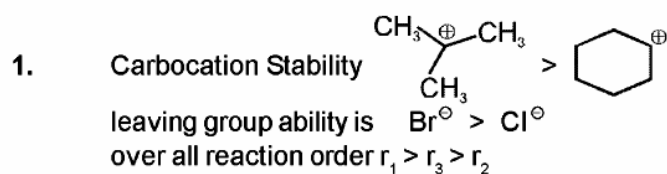
$$\text{Nucleophilicity} \propto \frac{1}{\text{conjugation}}$$

5. (A) - p,s ; (B) - p,q,s ; (C) - q,r ; (D) - p,s.

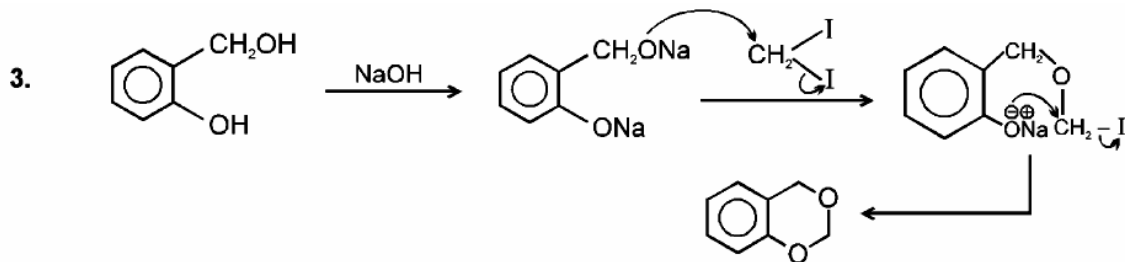
6. Polar (a, c, e, f, h)
Non-polar (b, d, g)



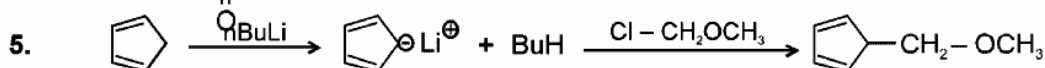
DPP No. # 20



Me_2S is the best leaving group (Leaving group ability order is $Me_2S > H_2O > CH_3OH > (CH_3)_3N$).



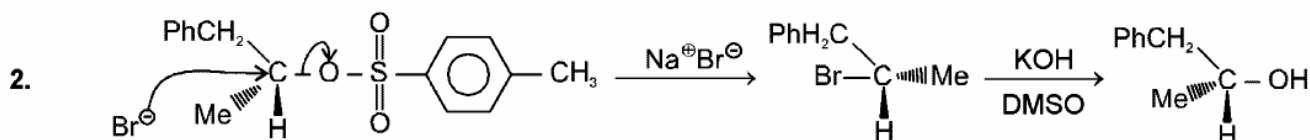
4. (1) The 'N' atom does not have vacant orbitals.
 (2) It is an electron deficient species, carbene (electrophile)
 (3) $\text{Ph}-\text{C}=\ddot{\text{N}}:$, It is electron deficient species, Nitrene (electrophile)



6. (a) The carbocation intermediate of (I) formed in solvolysis reaction is more stable due to formation of CPM C⁺.

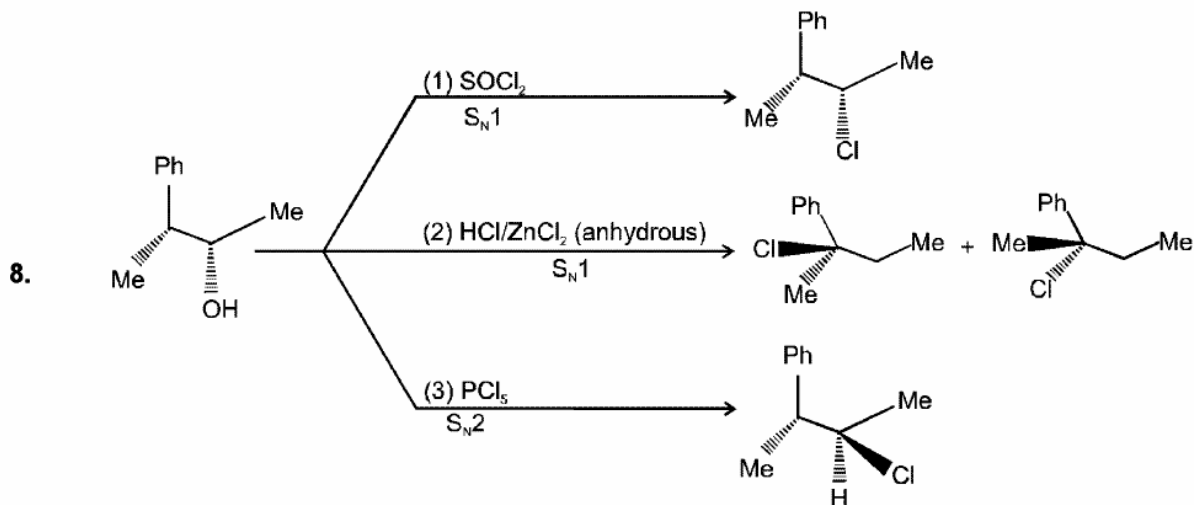
DPP No. # 21

1. According to carbocation stability

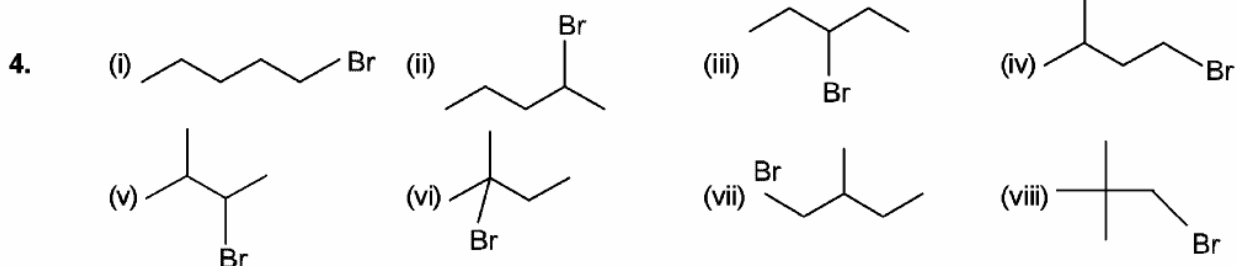
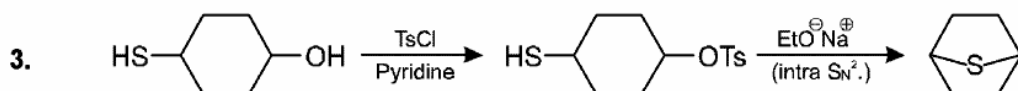


4. According to stability of carbocation

7. The carbon halogen bond in aryl halides has partial double bond character.



DPP No. # 22

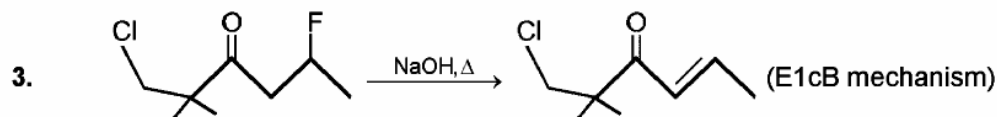


Total 8 structural isomers.
 (viii) is inert towards E-2
 (ii) gives three alkenes in E-2

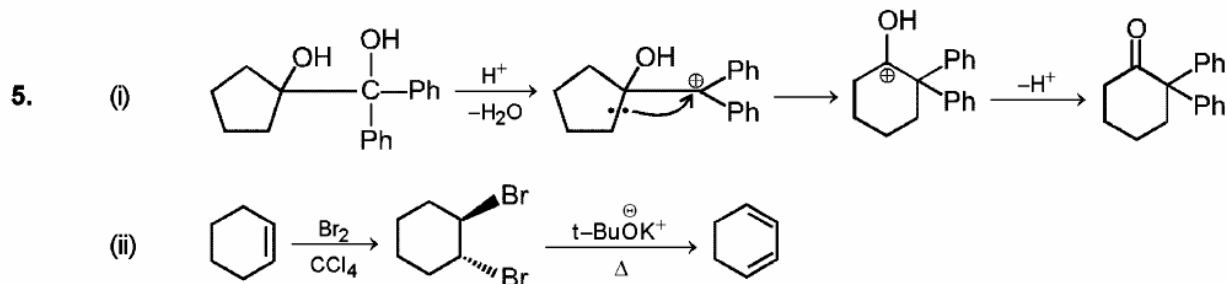
- 5*. Strong electronegative group (F , NR_3^+ , SR_2^+) exert strong -I due to this reaction followed by E1cB mechanism. $t-BuO^\ominus$ also give Hoffmann product.
- 6*. C_2H_5OH give S_N1 and E1 reaction, so all products can be formed.
7. The cleavage of C–D bond is more difficult than the cleavage of C–H bond.
8. $A \longrightarrow t$ $B \longrightarrow p,r$ $C \longrightarrow p$ $D \longrightarrow s$
9. The better yield will be obtained by using the secondary halide, 1-bromo-1-phenylthane, because the desired reaction is E2.

DPP No. # 23

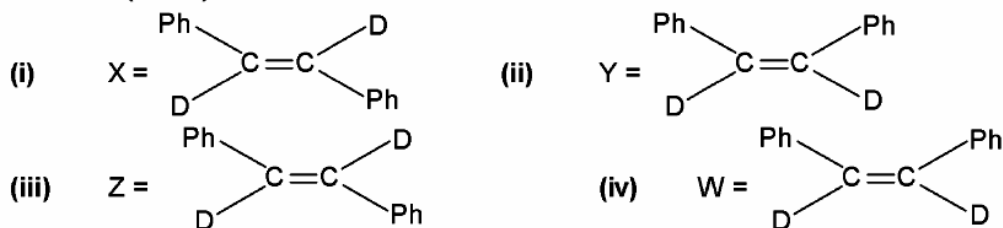
2. At this position –ve charge density will be maximum due to +I effect of CH_3 group.



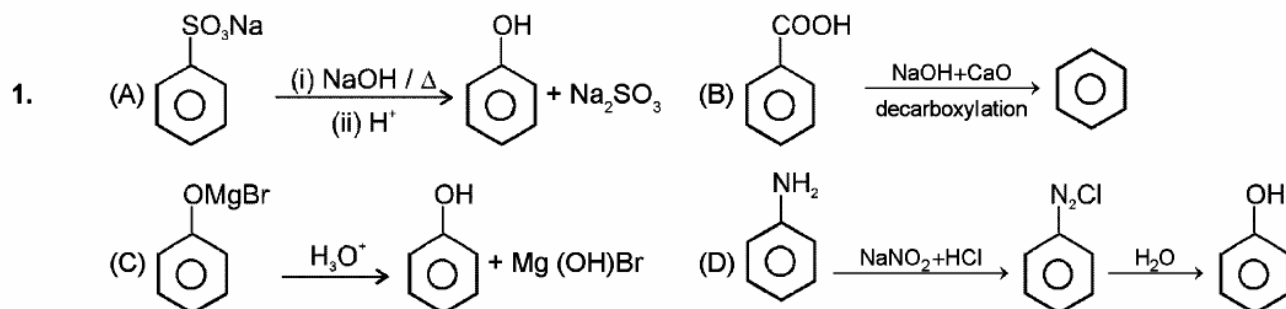
- 4*. Strong electronegative group (F , NR_3^+ , SR_2^+) exert strong -I due to this reaction followed by E1cB mechanism. $t-BuO^\ominus$ also give Hoffmann product.

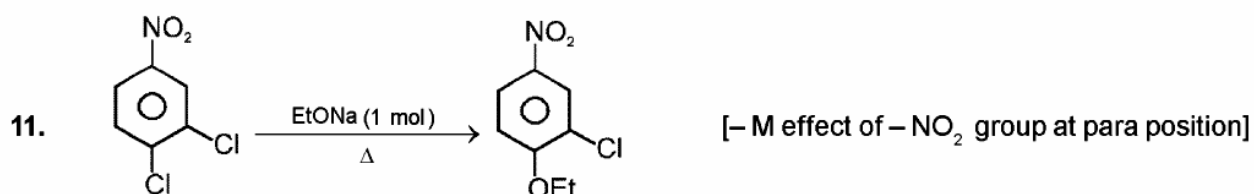
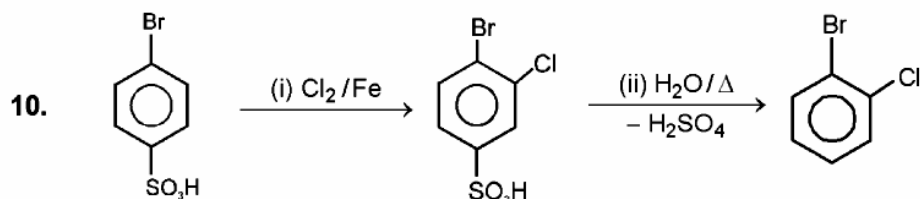
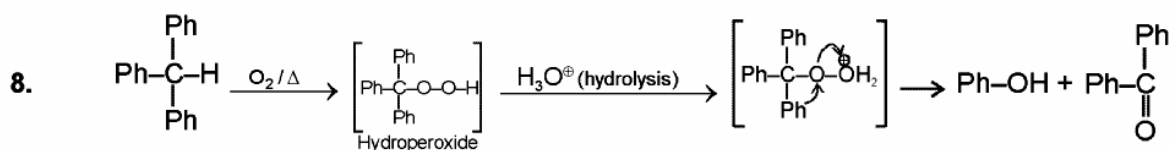
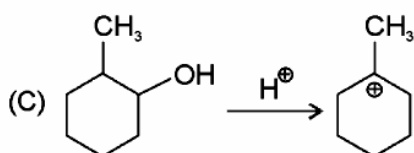
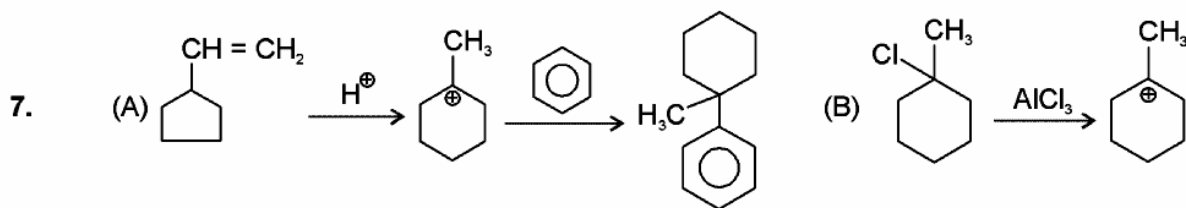
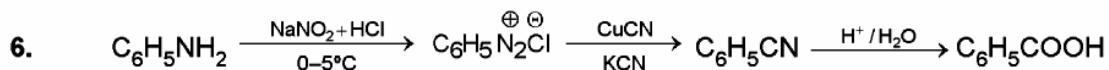
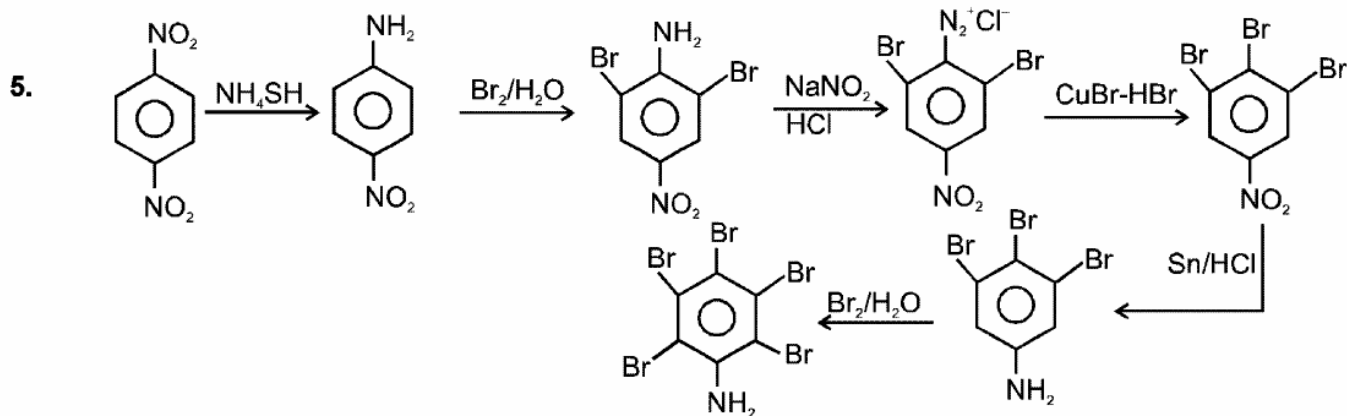
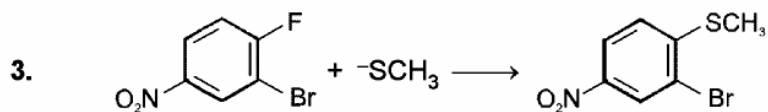
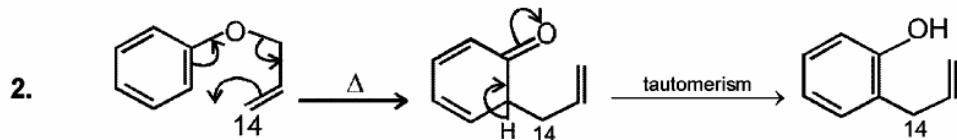


6. 8
 Comprehension (7 to 9)

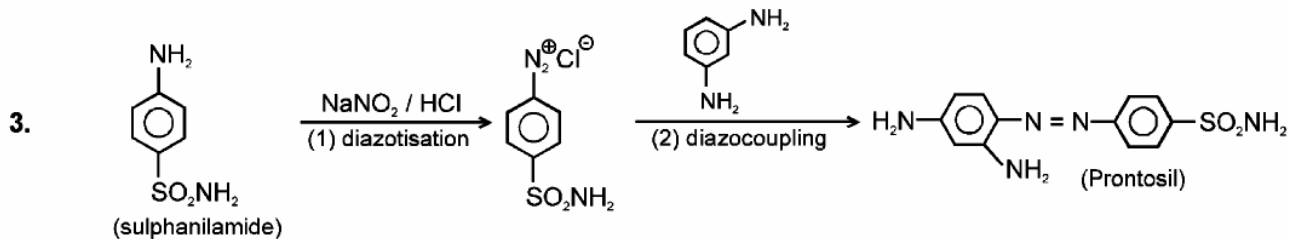


DPP No. # 24



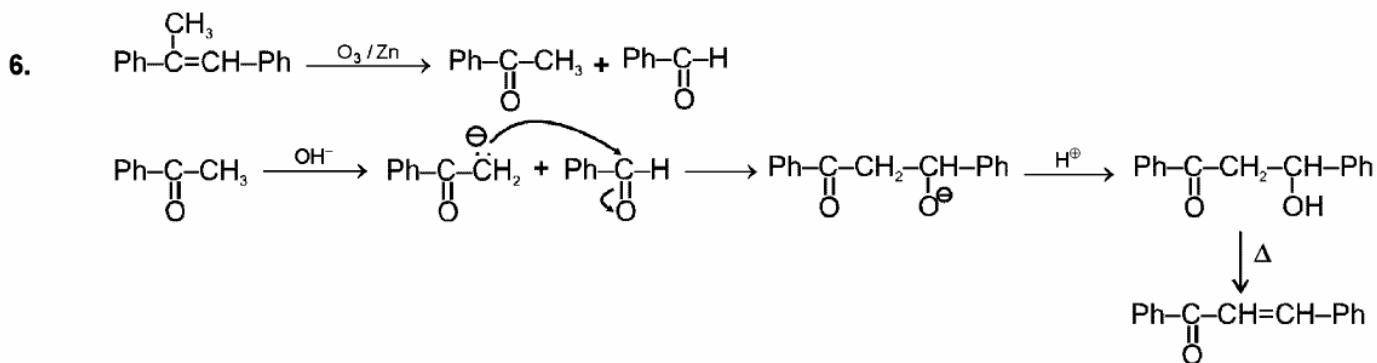
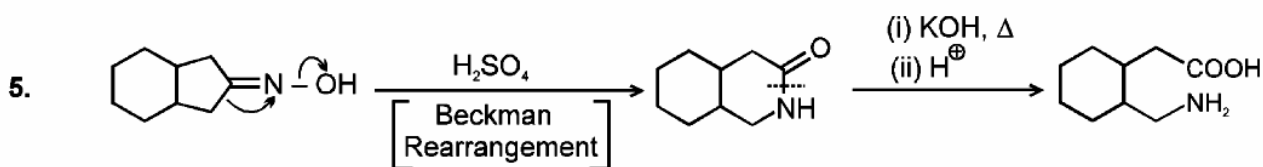
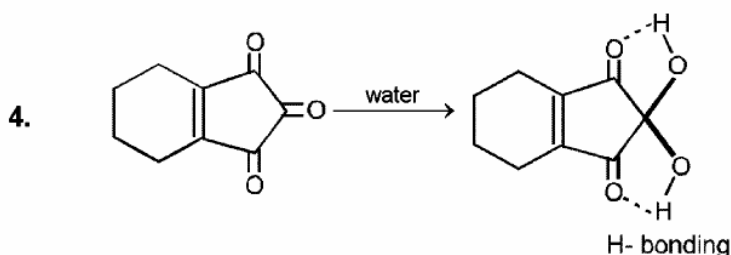


DPP No. # 25

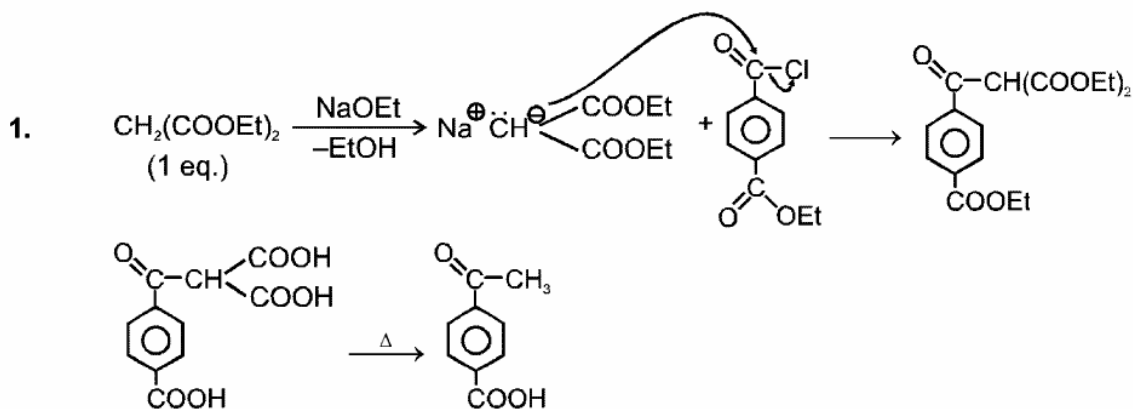


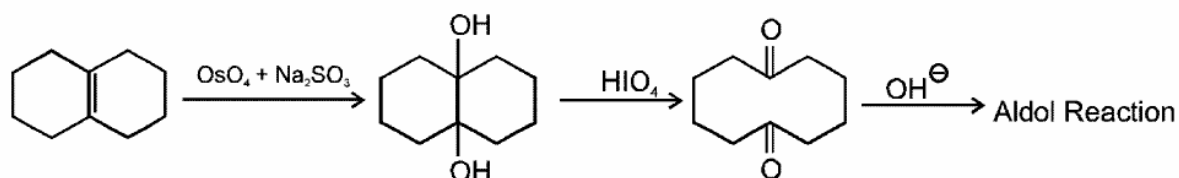
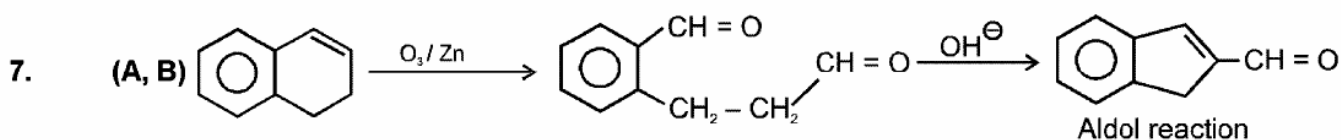
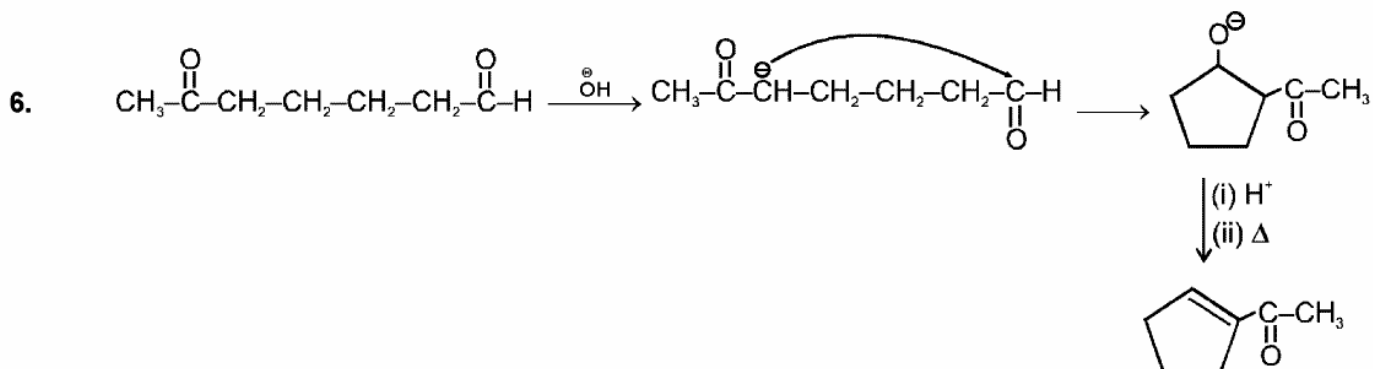
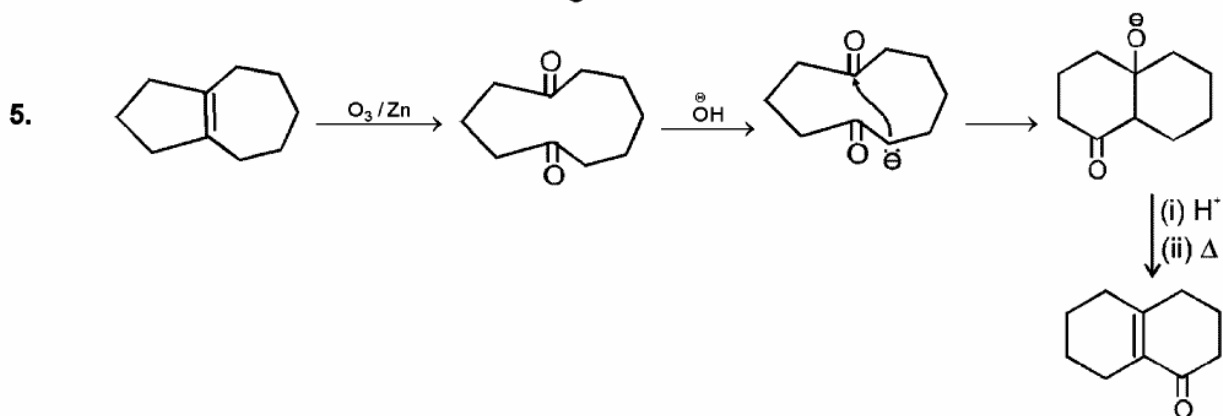
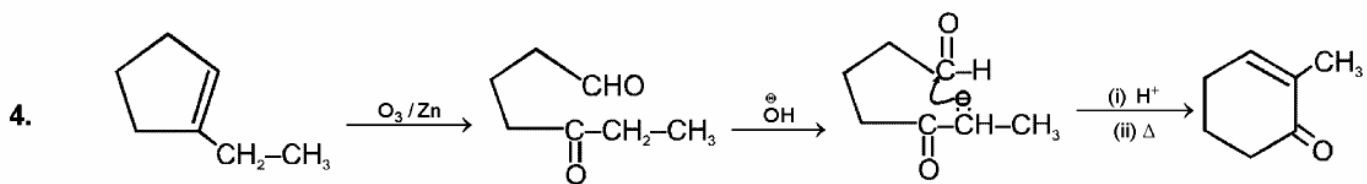
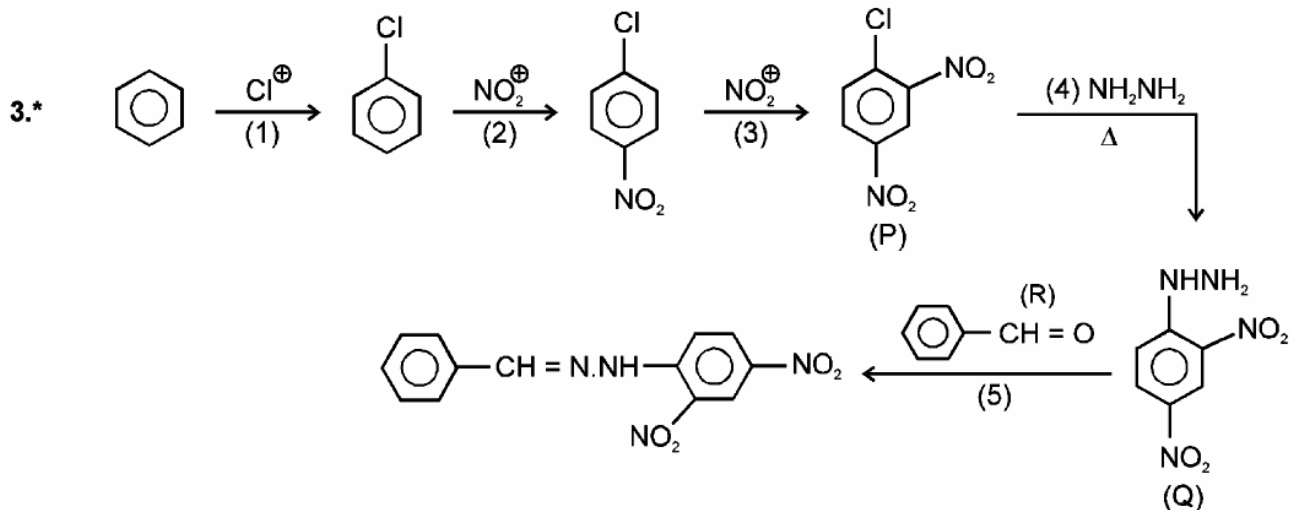
DPP No. # 26

3. Relative rate towards nucleophilic addition depends on
 a. Electron factor i.e. more the amount of positive charge on carbonyl carbon more reactive the carbonyl compound is
 b. Steric factor i.e. more the crowdness, less reactive the molecule is.

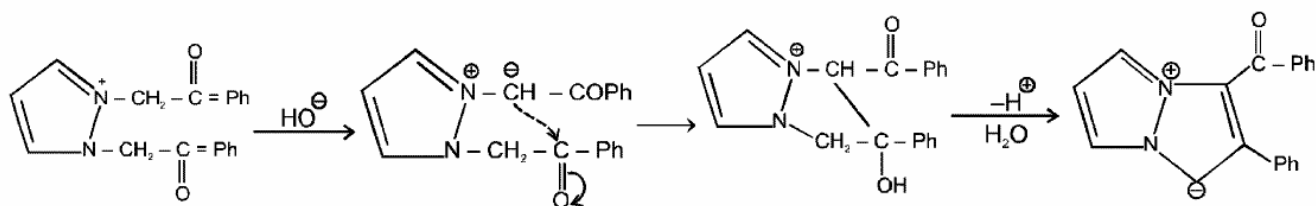


DPP No. # 27

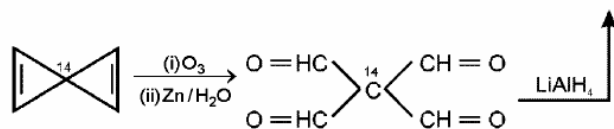
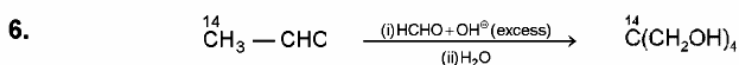
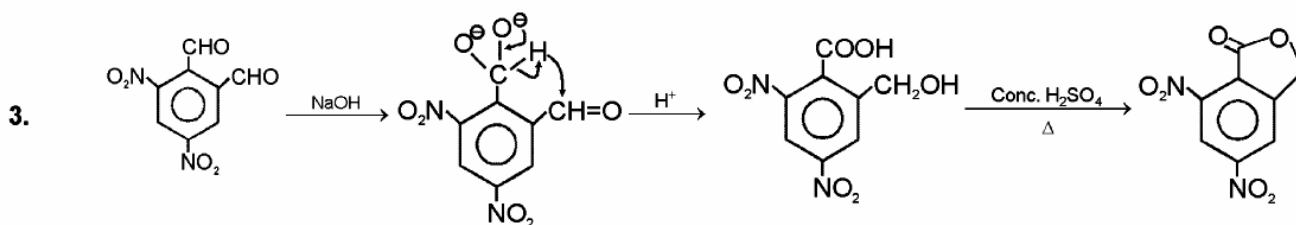
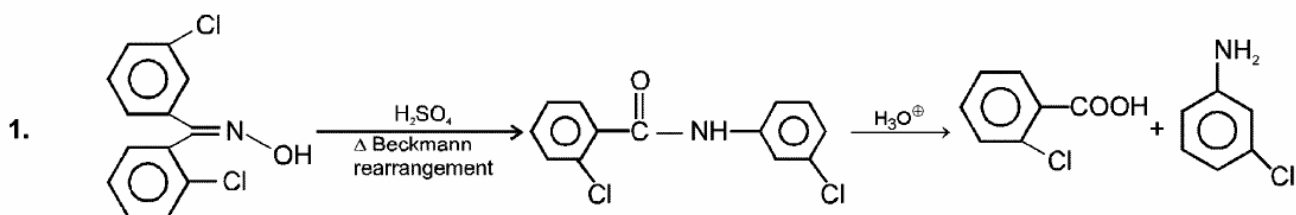




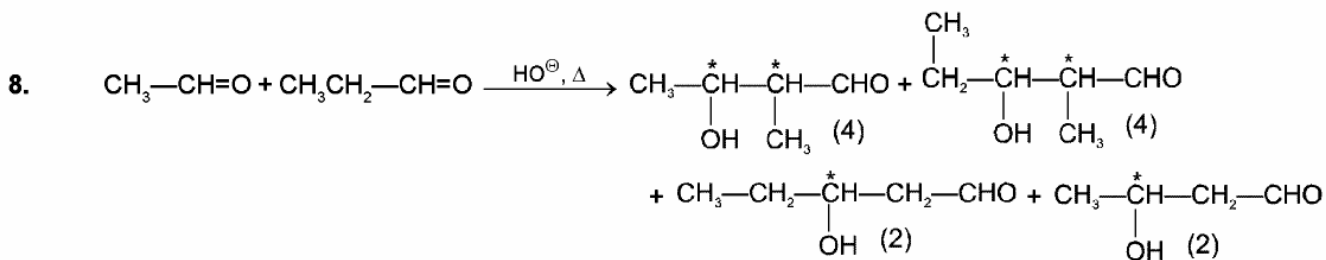
(C) It is direct Aldol reaction



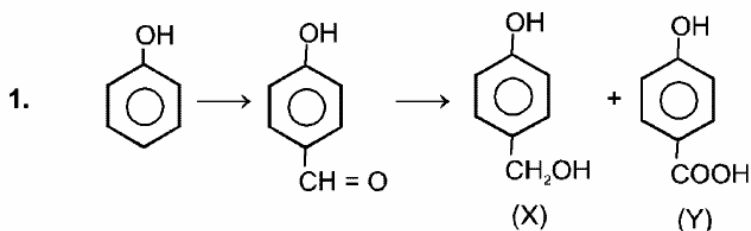
DPP No. # 28

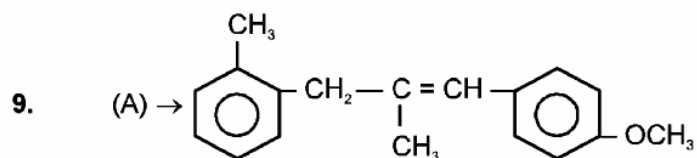
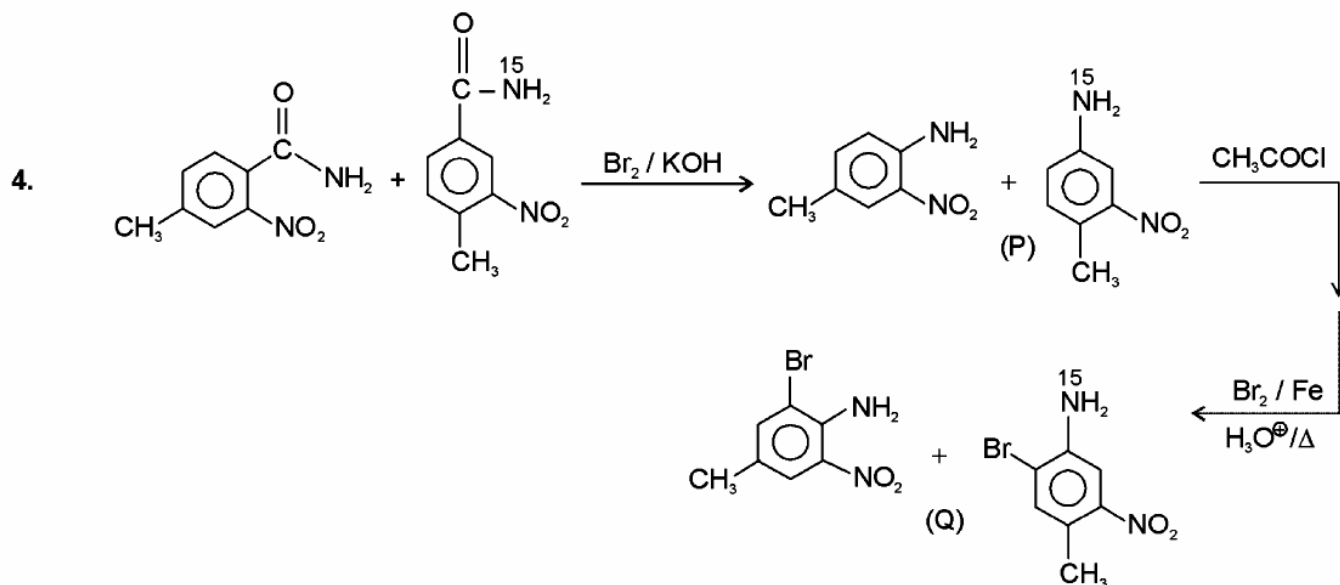
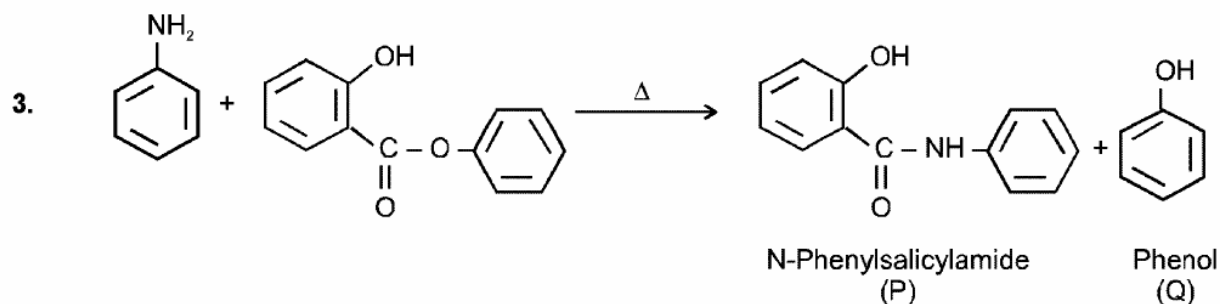
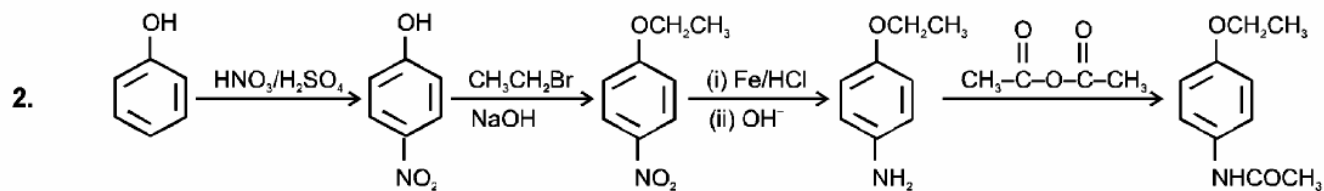


7. p-Toluidine has aromatic -NH_2 group which gives orange red dye with NaNO_2/HCl and β -Naphthol, while p-cresol does not give this test.

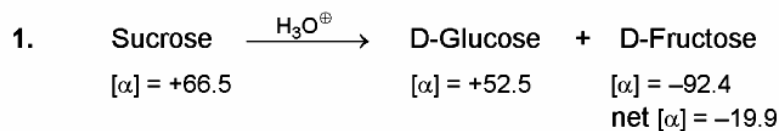


DPP No. # 29

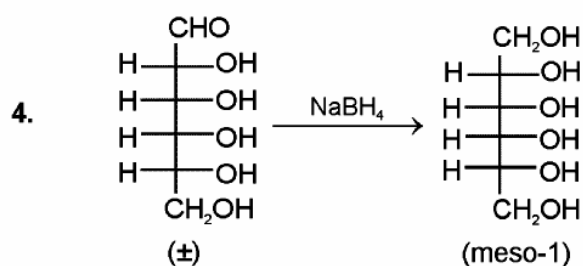


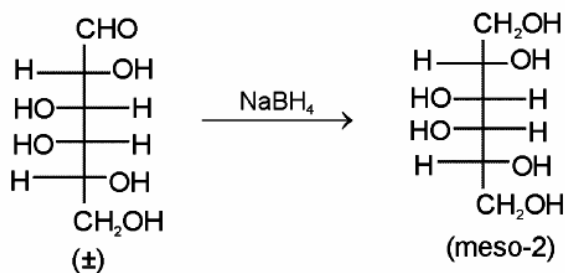


DPP No. # 30



3. Cellulose is the polymer of glucose



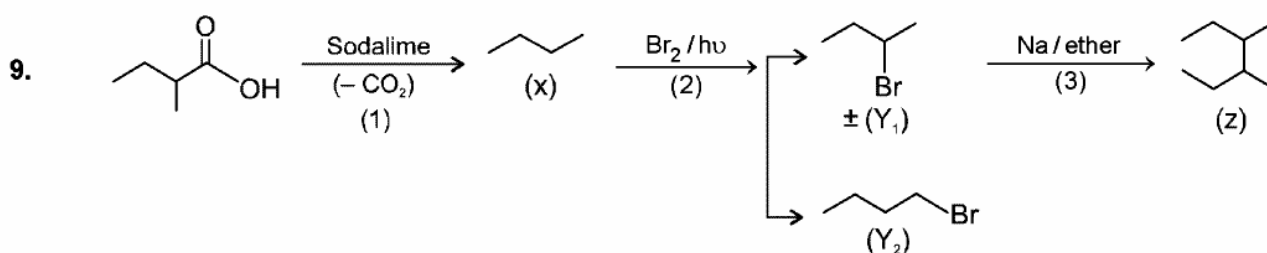
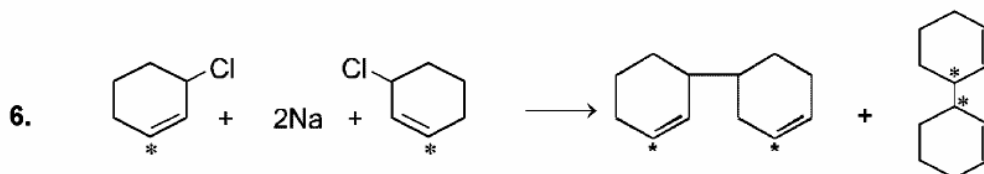
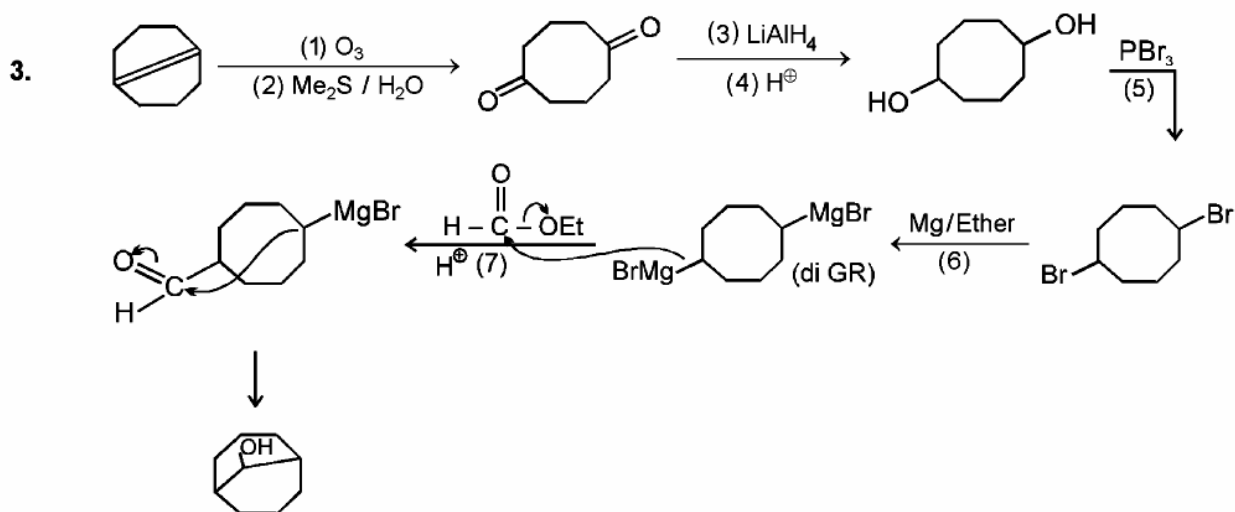
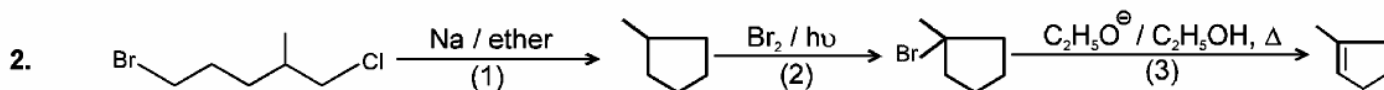


so in total 4 stereoisomers are reduced to meso products.

5. (D) The compound is sucrose which on hydrolysis gives equimolar mixture of glucose and fructose.
6. (C) It has cyclic acetal structure.
7. S_2 and S_4 are correct. S_1 and S_3 is incorrect because anomers are those which have difference in configuration at C-1.
8. 'A' contains more basic groups.
- 9.* It is non-reducing sugar because it lacks hemiacetal linkage. Its hydrolysis product is β -D-Glucose.
- 10.* Dipeptide is formed by 1° amide linkage between 2 amino acid molecules.

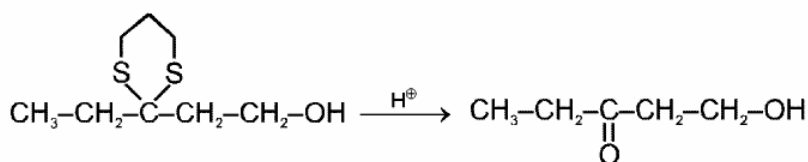
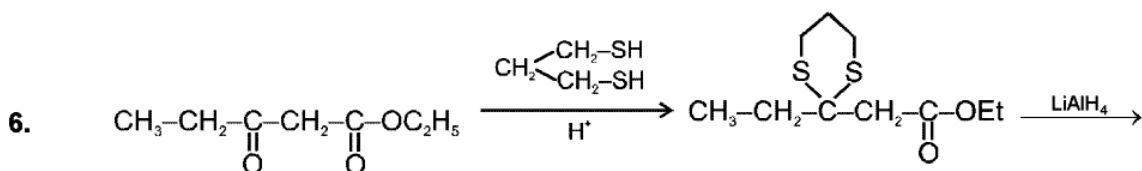
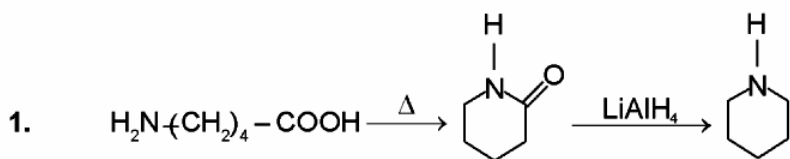
DPP No. # 31

1. Bridge has carbon sp^2 .



10. (A) Bakelite is made from phenol and methanal.
 (B) Dacron is obtained by the condensation of ester of terephthalic acid and ethylene glycol.
 (C) Nylon-66 is obtained by the condensation of 1,6-hexanedioic acid and 1,6-diamino hexane.
 (D) Buna-S is an addition polymer of butadiene, styrene.

DPP No. # 32



8-10.

