ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 19

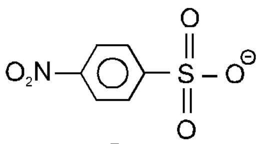
Total Marks : 32

Max. Time : 36 min.

Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

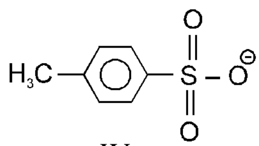
Type of Questions		**M.M., Min.**
Single choice Objective ('–1' negative marking) Q.1 to Q.3	(3 marks 3 min.)	[9, 9]
Multiple choice objective ('–1' negative marking) Q.4	(4 marks 4 min.)	[4, 4]
Match the Following (no negative marking) Q.5	(8 marks 10 min.)	[8, 10]
Subjective Questions ('–1' negative 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 :


I

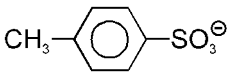
$\overset{\ominus}{O}H$
II

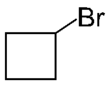
$CH_3COO^{\ominus}$
III

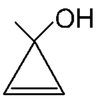
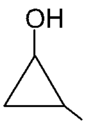
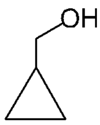
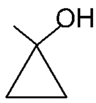

IV

(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) 
(C) $^{\ominus}OH$
(D) $I^{\ominus}$

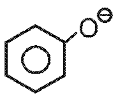
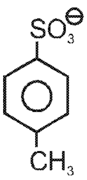
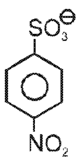
3.  $\xrightarrow{\text{aq. AgNO}_3}$ 'X' (Major) product :

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

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

(A) $F^- < Cl^- < Br^- < I^-$
(B) $PhS^- > PhO^-$
(C) $CH_3O^- > OH^- > H-\underset{\underset{O}{\parallel}}{C}-O^- > CH_3-\underset{\underset{O}{\parallel}}{C}-O^- > C_6H_5-O^-$
(D) $(CH_3)_3\ddot{P} > (CH_3)_3\ddot{N}$

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

Column – I	**Column – II**
(A) $\overset{\ominus}{N}H_2 < N_2$	(p) leaving group ability in S_N reaction
(B) $F^{\ominus} < I^{\ominus}$	(q) Nucleophilicity
(C) $CH_3-\underset{\underset{O}{\parallel}}{C}-O^{\ominus}$ < 	(r) basicity
(D)  < 	(s) Stability

6. Label each of the following solvent as Polar or non-polar :

(a) CH_3-O-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 Zn/H_2O (b) O_3 followed by H_2O_2
(c) hot. conc. $KMnO_4/OH^{\ominus}$ (d) cold.dil. alkaline $KMnO_4$
(e) $OsO_4/H_3O^{\oplus}$ (f) $PhCO_3H$ followed by $H_3O^{\oplus}$
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) Lindllar's Reagent $\rightarrow$ [Pd + $BaSO_4$ + Quinoline + S]

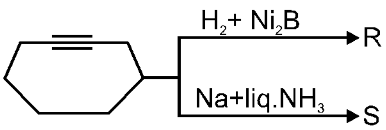
(ii) P-2 catalyst $\rightarrow$ (Ni_2B)

(iii) Hydroboration- Reduction [(i) - B_2H_6]/THF (ii) $H_3O^{\oplus}$ or CH_3COOH]

(iv) Birch reduction $\rightarrow$ (Li/liq, NH_3 or Na/liq.NH_3) (only non-terminal alkynes)
First three are syn-addition but (iv)th is anti-addition.
Write product(s) in each care :

(a) $CH_3-C\equiv C-CH_3 \xrightarrow{H_2+Pd+BasO_4+Quinoline+S} P$

(b) $Ph-C\equiv C-Ph \xrightarrow{Li+liq.NH_3} Q$

(c) 

(d) $Ph-C\equiv C-Me \xrightarrow[\text{(ii) } CH_3COOH]{\text{(i) } B_2H_6/THF} T$

Answer Key

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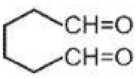
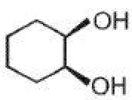
1. (D) 2. (D) 3. (C) 4*. (A,B,D)

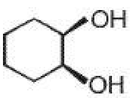
5. (A - p,s); (B - p,q,s); (C - q,r); (D - p,s). 6. Polar (a, c, e, f, h) ; Non-polar (b, d, g)

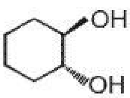
7. (a) 

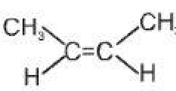
(b) 

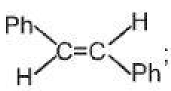
(c) 

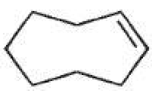
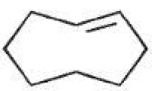
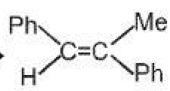
(d) 

(e) 

(f) 

8. P $\rightarrow$ 

; Q $\rightarrow$ 

; R $\rightarrow$ 
; S $\rightarrow$ 
; T $\rightarrow$ 

Hints & Solutions

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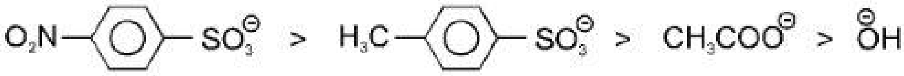
1. (D) 

Weaker bases are better leaving groups.

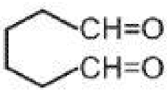
2. I⁻ is the strongest nucleophile as well as best leaving group.

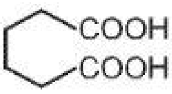
4*. Nucleophilicity $\propto$ Size of donor atom (in group).

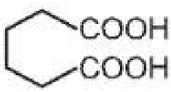
Nucleophilicity $\propto \frac{1}{\text{conjugation}}$

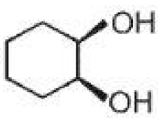
5. (A) – p,s ; (B) – p,q,s ; (C) – q,r ; (D) – p,s.

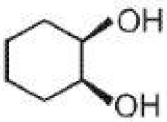
6. Polar (a, c, e, f, h)
Non-polar (b, d, g)

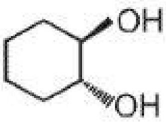
7. (a) 

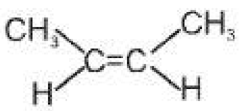
(b) 

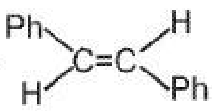
(c) 

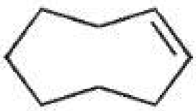
(d) 

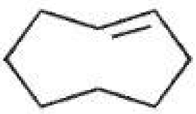
(e) 

(f) 

8. P → 

Q → 

R → 

S → 

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