ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

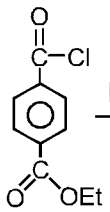
DPP No. 27

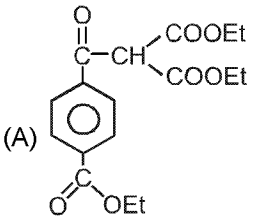
Total Marks : 36

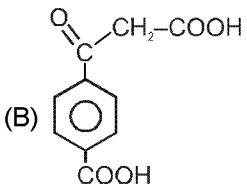
Max. Time : 39 min.

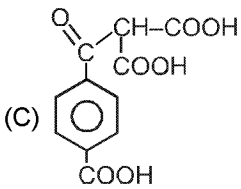
Topic : Aldehydes, Ketones

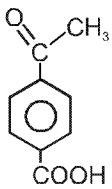
Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.3	(3 marks 3 min.)	[12, 12]
Comprehension ('–1' negative marking) Q.4 to Q.6	(3 marks 3 min.)	[12, 12]
Subjective Questions ('–1' negative marking) Q.7	(4 marks 5 min.)	[4, 5]
Match the Following (no negative marking)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

1. $CH_2(COOEt)_2$ (1 Eq.) +  $\xrightarrow{NaOEt}$ $\xrightarrow{1.\ dil.\ NaOH\ /\ \Delta}$ $\xrightarrow{\Delta}$ Final product is

(A) 

(B) 

(C) 

(D) 

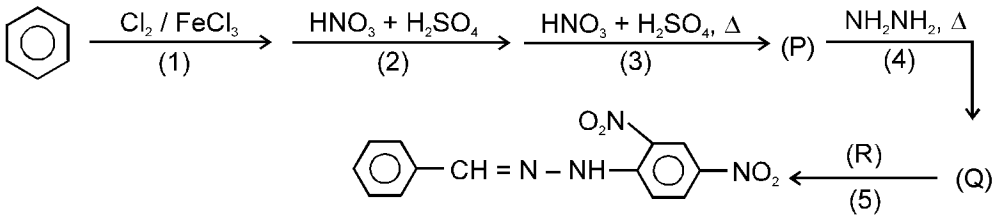
2. $PhCHO + BrCH_2CO_2Et \xrightarrow[(2)\ H_2O]{(1)\ Zn} (A) \xrightarrow[(-H_2O)]{} (B)$

Product of (B) of the above reaction is :

(A) Ph – CH = CH – CH_3 (B) Ph – CH = CH – CO_2Et

(C) Ph – CH = CH – CH_2 – OH (D) Ph – CH = CH – CH_3

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

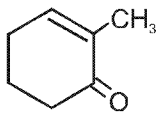
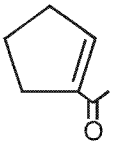
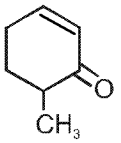
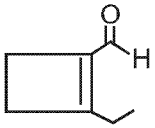
(D) The end product is a mixture of three compounds

Comprehension # (Q. 4 to 6)

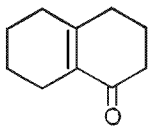
Intramolecular aldol condensation :

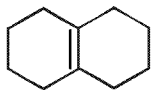
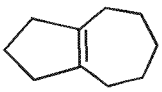
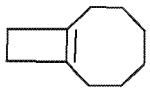
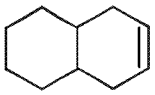
The aldol condensation also offer a convenient way to synthesize molecules with five and six membered ring. This can be done by an intramolecular aldol condensation using a dialdehyde, a keto aldehyde or a diketone as the substrate. The major product is formed by the attack of the enolate from the ketone 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

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

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

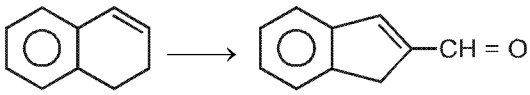
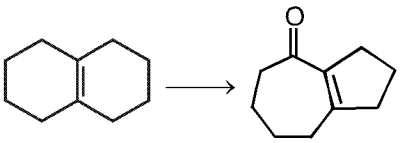
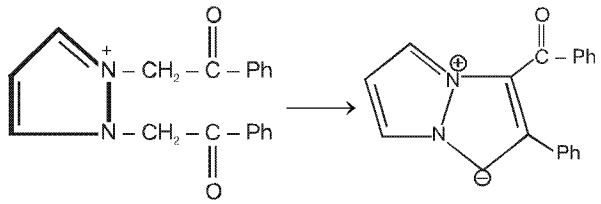
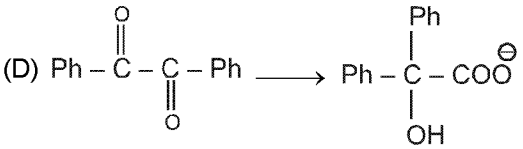


(A)  (B)  (C)  (D) 

6. The true statement about the major product of  in reaction with aq. NaOH followed by heating is.

(A) It gives yellow ppt with $I_2/\overset{\ominus}{O}H$
(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)**
(A) 	(p) 1. $\frac{O_3}{Zn}$, 2. $\frac{NaOH}{\Delta}$
(B) 	(q) 1. $\frac{OsO_4}{Na_2SO_3}$, 2. HIO_4, 3. $\frac{KOH}{\Delta}$
(C) 	(r) NaOH
(D) 	(s) 1. $\frac{HCN}{\Delta}$, 2. $H_3O^{\oplus}$

8. How will you convert ethanal into the following compounds ?
(i) Butane-1, 3-diol (ii) But-2-enal (iii) But-2-enoic acid

Answer Key

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

8. (i) $CH_3—CH=O \xrightarrow{\text{dil } OH^{\ominus}} CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_2—CH=O \xrightarrow{NaBH_4} CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_2—CH_2—OH$

(ii) $CH_3—CH=O \xrightarrow{\text{dil } OH^{\ominus}} CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_2—CH=O \xrightarrow{\Delta} CH_3—CH=CH—CH=O$

(iii) $CH_3—CH=O \xrightarrow{\text{dil } OH^{\ominus}} CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_2—CH=O \xrightarrow{\Delta} CH_3—CH=CH—CH=O$

$\downarrow [Ag(NH_3)_2]^+$

$CH_3—CH=CH—COOH$

Hints & Solutions

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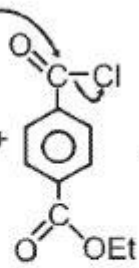
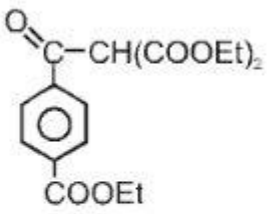
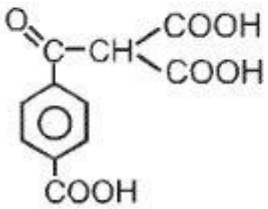
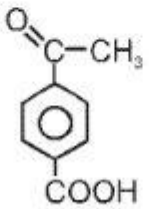
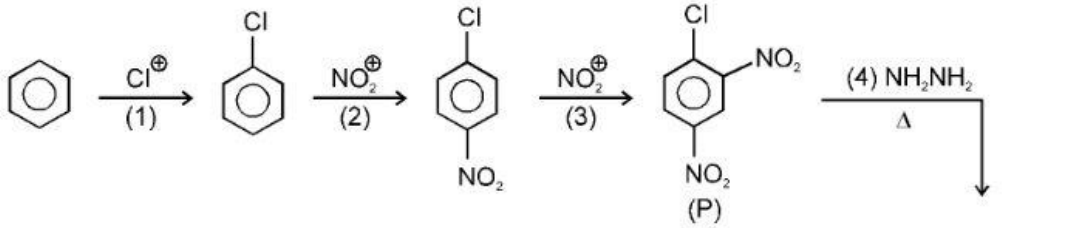
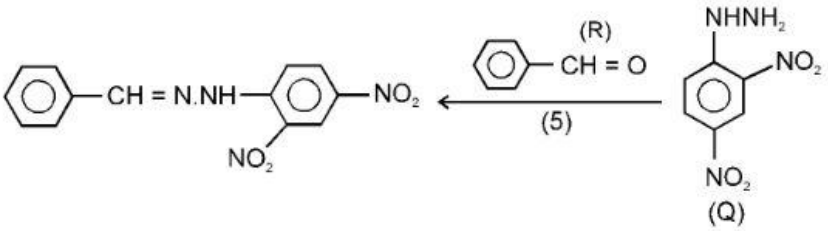
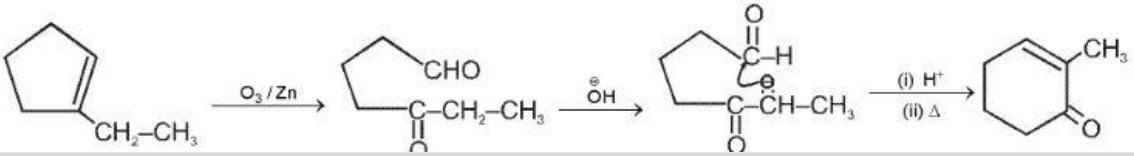
1. $CH_2(COOEt)_2$ (1 eq.) $\xrightarrow[-EtOH]{NaOEt} Na^{\oplus}\,\overline{:}CH(COOEt)_2$ +  → 

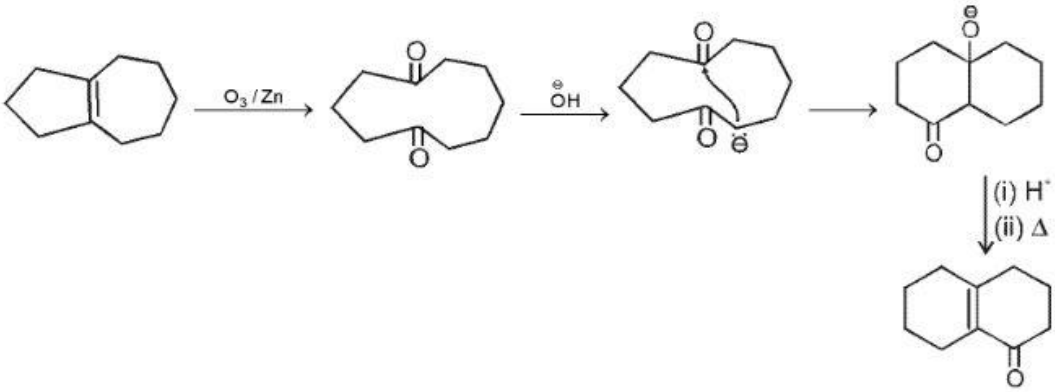
 $\xrightarrow{\Delta}$ 

3.* 

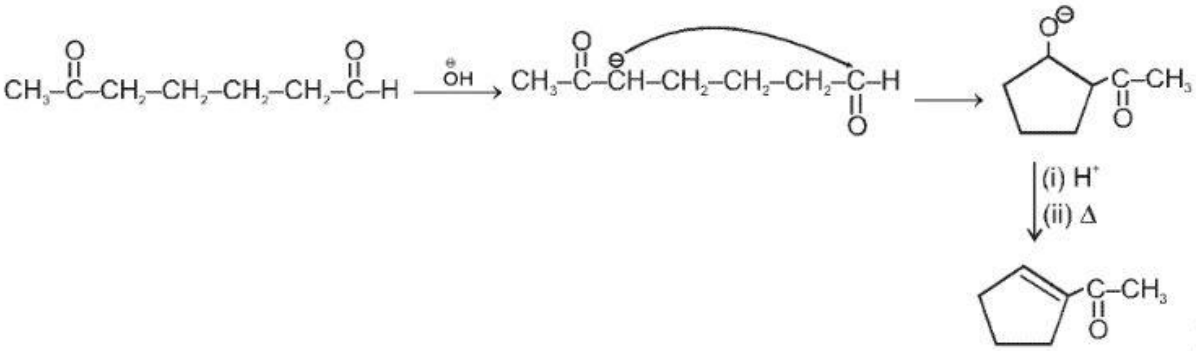


4. 

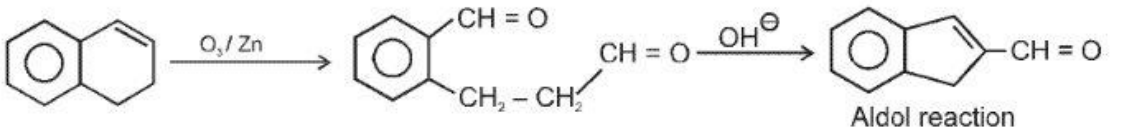
5.

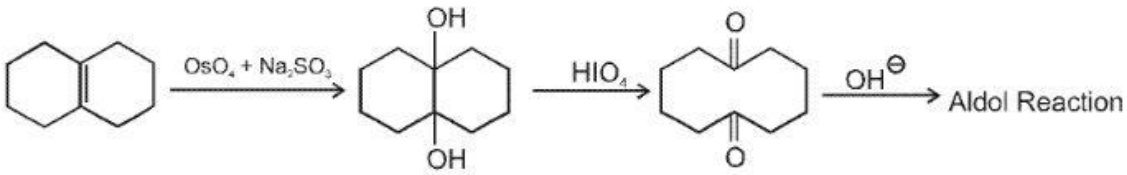


6.



7. (A, B)





(C) It is direct Aldol reaction