ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 10

Total Marks : 31

Max. Time : 31 min.

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

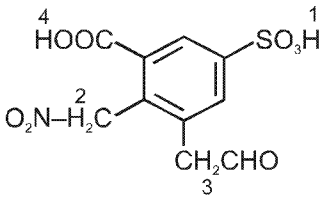
(A) $CF_3COOH > CCl_3COOH > CHCl_2COOH > NO_2CH_2COOH > N \equiv C - CH_2COOH > F-CH_2COOH$

(B) $F-CH_2COOH > Cl-CH_2COOH > BrCH_2COOH > HCOOH > Cl-CH_2CH_2COOH > C_6H_5COOH$

(C) $C_6H_5COOH > C_6H_5CH_2COOH > CH_3COOH > CH_3CH_2COOH$

(D) $CH_2 = CH - COOH < CH_3 - CH_2 - COOH$

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.

$H-C\equiv CNa + CH_3OH$

$\rightarrow HC\equiv CH + CH_3ONa$

$\xrightarrow{CH_3COOH} CH_3OH + CH_3COONa$

$\xrightarrow{CH_3SO_3H} CH_3SO_3Na + CH_3COOH$

The acidity order will be

(A) $HC\equiv CH > CH_3OH > CH_3COOH > CH_3SO_3H$. (B) $CH_3SO_3H > CH_3COOH > CH_3OH > HC\equiv CH$.

(C) $CH_3COOH > CH_3SO_3H > CH_3OH > HC\equiv CH$. (D) $CH_3SO_3H > CH_3COOH > HC\equiv CH > CH_3OH$.

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

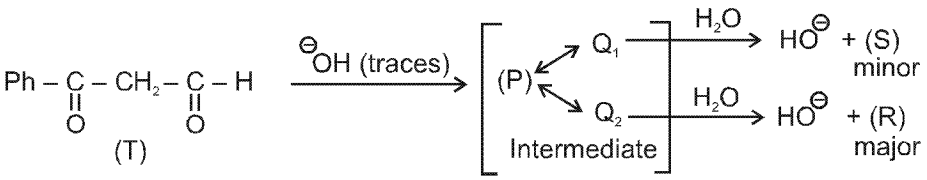
$CH_2 = CH - Cl$ (I) $\quad \overset{+}{C}H_2 - CH = \overset{-}{Cl}$ (II) $\quad \overset{-}{C}H_2 - CH = \overset{+}{Cl}$ (III)

(A) I > II > III (B) I > III > II

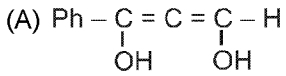
(C) III > II > I (D) II > I > III

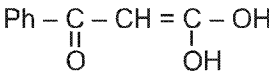
Comprehension #

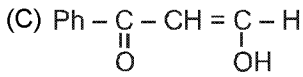
Observe the following reaction and answer the following questions

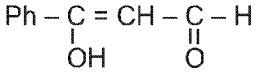


5. The product 'R' is

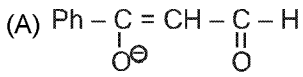
(A) 

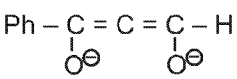
(B) 

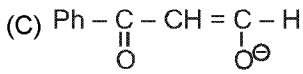
(C) 

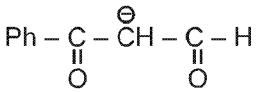
(D) 

6. The structure of Q_1 is

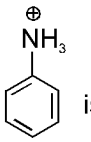
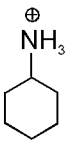
(A) 

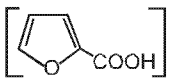
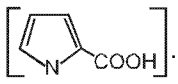
(B) 

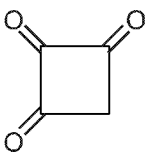
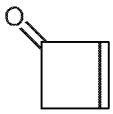
(C) 

(D) 

True/ False :

7.  is stronger acid than 

8. Furan-2-carboxylic acid  (I) is more acidic than pyrrole-2-carboxylic acid  (II).

9. Explain why  will tautomerise but  will not ?

10. Cis and trans-4-tert-butyl-2-methyl cyclohexanone are interconverted by base treatment. Explains 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 $FeCl_3$ test. Calculate its molecular weight.

Answer Key

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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]				

Hints & Solutions

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2. Acidic strength order is $-SO_3H > COOH > -CH_2-NO_2 > -CH_2CHO$

4.

$CH_2=CH-Cl$ (I) — non polar st.

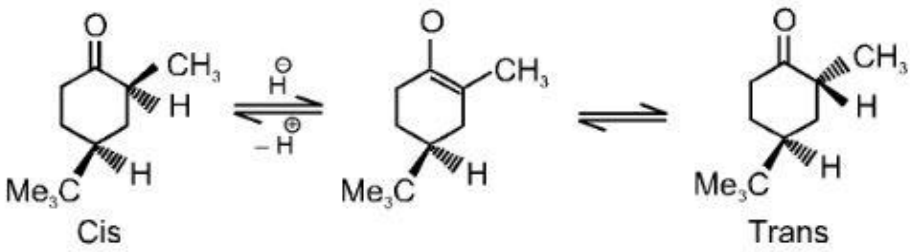
$\overset{+}{C}H_2-CH=\overset{-}{Cl}$ (II) — octet of carbon is incomplete

$\overset{-}{C}H_2-CH=\overset{+}{Cl}$ (III) — octet of carbon is complete

8. Oxygen is more electronegative than nitrogen hence stabilises the carboxylate anion better.

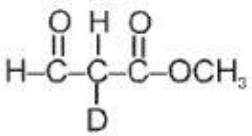
9. Enol of second is antiaromatic.

10. Because of enolisation



Cis Trans

11.



Molecular weight = **[103]**