ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 22

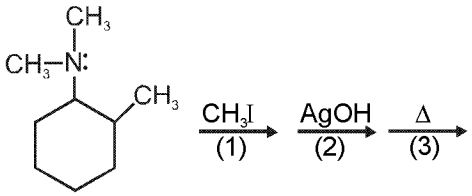
Total Marks : 35

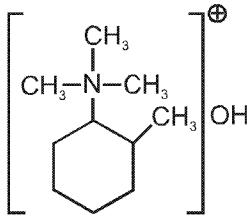
Max. Time : 38 min.

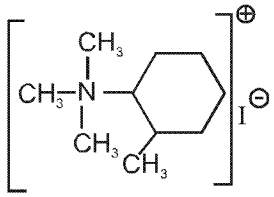
Topic : Alcohols, Phenols and Ethers (Reaction Mechanism)

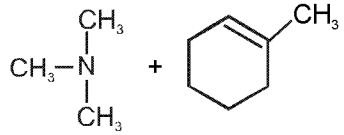
Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.4	(3 marks 3 min.)	[12, 12]
Multiple choice objective ('–1' negative marking) Q.5 to Q.6	(4 marks 4 min.)	[8, 8]
Short Subjective Questions ('–1' negative marking) Q.7	(3 marks 3 min.)	[3, 3]
Match the Following (no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

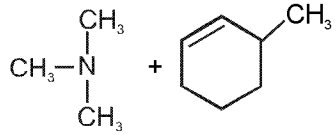
1. The major product of following sequence of reactions is :



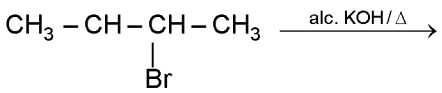
(A) 

(B) 

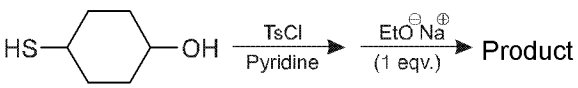
(C) 

(D) 

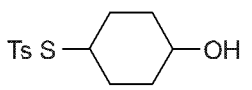
2. For the given reaction choose the correct option:



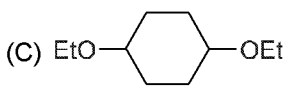
(A) Reaction is regioselective but not stereoselective.
(B) Reaction is stereoselective but not regioselective.
(C) Reaction is both regioselective and stereoselective .
(D) Reaction is none of regioselective and stereoselective .

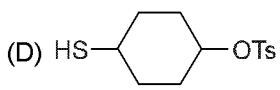
3. 

The product is :

(A) 

(B) 

(C) 

(D) 

4. The correct statement(s) about $C_5H_{11}Br$ is/are :
(A) Total 8 structural isomers are possible for $C_5H_{11}Br$
(B) Two out of the all structural isomers of $C_5H_{11}Br$ are inert towards E-2 reaction
(C) Only one out of all structural isomers of $C_5H_{11}Br$ gives three products in E-2 reaction.
(D) Only two out of all structural isomers of $C_5H_{11}Br$ produce alkene which can show geometrical isomerism.

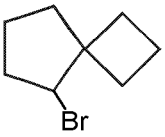
5*. In which reaction product formation takes place by Hoffmann rule ?

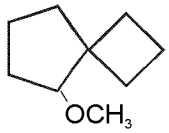
(A) $CH_3-CH_2-\underset{\underset{Br}{|}}{CH}-CH_3 \xrightarrow[\Delta]{t\text{-}BuO^{\ominus}\,K^{\oplus}}$

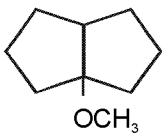
(B) $CH_3-CH_2-\underset{\underset{F}{|}}{CH}-CH_3 \xrightarrow[\Delta]{CH_3CH_2O^{\ominus}\,K^{\oplus}}$

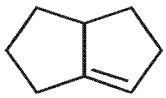
(C) $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-\overset{\oplus}{N}(CH_3)_3 \xrightarrow[\Delta]{OH^{\ominus}}$

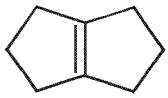
(D) $CH_3-CH_2-\underset{\underset{\oplus S(CH_3)_2}{|}}{CH}-CH_3 \xrightarrow[\Delta]{OH^{\ominus}}$

6*.  $\xrightarrow[heat]{CH_3OH}$ product, which of the following products are possible ?

(A) 

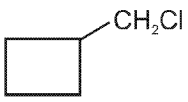
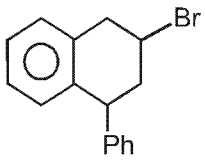
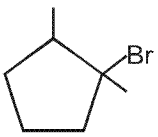
(B) 

(C) 

(D) 

7. The rate of bimolecular elimination reaction of CH_3-CH_2-Br is faster than CD_3-CH_2-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) $Ph-\overset{\overset{O}{\|}}{C}-CH_2-CH_2-CH_2Br \xrightarrow[\Delta]{CH_3CH_2ONa}$	(p) S_N1
(B)  $\xrightarrow[\Delta]{CH_3CH_2OH}$	(q) S_N2
(C)  $\xrightarrow{H_2O,\Delta}$	(r) E1
(D)  $\xrightarrow[\Delta]{CH_3ONa}$	(s) E2
	(t) E1cB

9. You have the task of preparing styrene ($C_6H_5CH=CH_2$) 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

Answer Key

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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.

$$R\text{–}OH + HCl \xrightarrow{ZnCl_2} R\text{–}Cl \text{ (white ppt.)} + H_2O$$

3° Alcohol → Instant turbidity
2° Alcohol → After 5 minute turbidity appear.
1° Alcohol → After 30 minute turbidity appear.

Hints & Solutions

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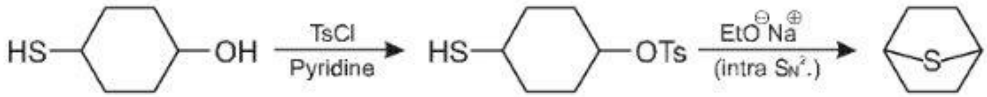
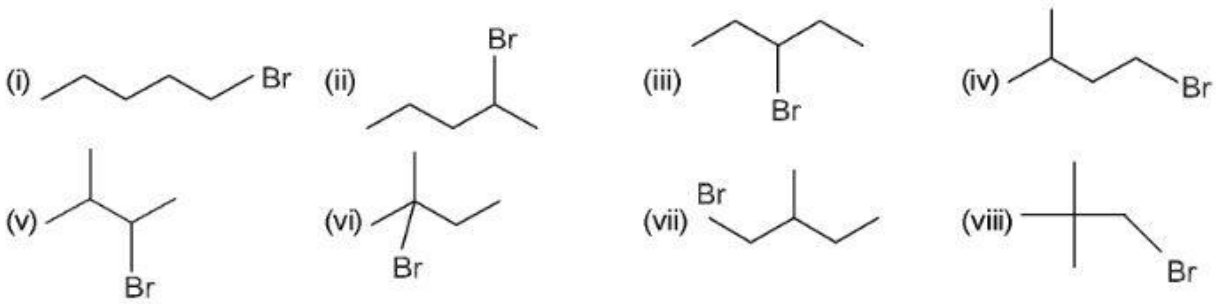
3.



4.



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

5*. Strong electronegative group (F, $\overset{+}{N}R_3$, $\overset{+}{S}R_2$) 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 ⟶ 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.