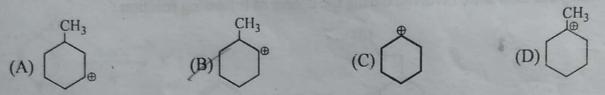
## Which of the following carbocation is most stable?

$$(A) H3C CH3 CH3$$

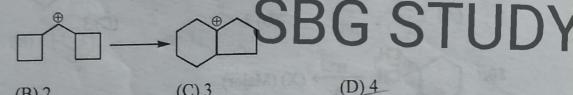
Which carbocation is least likely to be formed as an intermediate?

$$(A) (C_6H_5)_3\overset{\oplus}{C} \qquad (B) \overset{\oplus}{\bigcirc} \qquad (C) \overset{\oplus}{\bigcirc} \qquad (D) CH_3-\overset{\oplus}{C}H_2$$

Which one of the following carbocation would you expect to rearrange:



How many 1,2-shifts are involved during the course of following reaction:



How many following carbocation undergo re-arrangement -

(B)2

(a) 
$$CH_3CH_2CH_2^+$$
 (b)  $(CH_3)_2CH^+CHCH_3$  (c)  $(CH_3)_3C^+CHCH_3$  (d)  $(CH_3CH_2)_3CCH_2^+$ 

(e) 
$$\leftarrow$$
 CH<sub>3</sub> (f)  $\leftarrow$  (g)  $\leftarrow$  CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub> (h)  $\leftarrow$  CH<sub>3</sub>-CH<sub>2</sub>-O

(A) 5

(A) 1

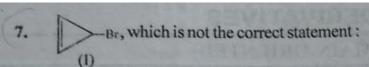
$$(I) \bigcirc -CI \longrightarrow \bigcirc \oplus + Cl^{\ominus}, \Delta H_{1}^{o} \qquad (II) \bigcirc -CI \longrightarrow \bigcirc \oplus + Cl^{\ominus}, \Delta H_{2}^{o}$$

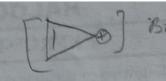
$$(III) \bigcirc -CH_{2}CI \longrightarrow \bigcirc -CH_{2} + Cl^{\ominus}, \Delta H_{3}^{o} \qquad (IV) \bigcirc -CI \longrightarrow \bigcirc \oplus + Cl^{\ominus}, \Delta H_{4}^{o}$$

The correct decreasing order of enthalpies of reaction for producing carbocation is:

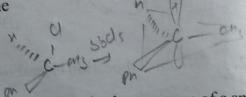
(A) 
$$\Delta H_1^o > \Delta H_2^o > \Delta H_3^o > \Delta H_4^o$$
 (B)  $\Delta H_4^o > \Delta H_1^o > \Delta H_2^o > \Delta H_3^o$ 

(C) 
$$\Delta H_3^o > \Delta H_2^o > \Delta H_1^o > \Delta H_4^o$$
 (D)  $\Delta H_2^o > \Delta H_1^o > \Delta H_4^o > \Delta H_3^o$ 





- (A) I is more soluble than bromocyclopropane
- (B) I gives pale yellow ppt. on addition with AgNO<sub>3</sub>
- (C) I is having lower dipole moment than bromocyclopropane
- (D) I is more ionic than



- A solution of (-) -1-chloro-1-phenylethane in toluene racemises slowly in the presence of a small Lieu amount of SbCl5, due to the formation of :-
  - (A) carbanion
- (B) Carbene
- (e) carbocation
- (D) free radical

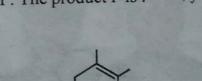
(D) 4

How many 1,2-Shifts are involved during the course of following reaction:

10. 
$$CH_3 \xrightarrow{H^+} (X) (Major)$$
OH alcele

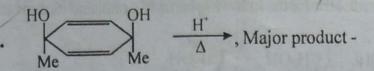
Product (X) is:

11. 
$$OH \xrightarrow{H^+} P$$
. The product P is:



- Among the given compounds, the correct dehydration order is: 12.
- (III)

- (A) I < III < IIII < IV (B) II < IIII < IV < I
- (C) I < III < IV < II
- (D) I < II < III = IV



Dungable

Rate of dehydration when given compounds are treated with conc. H<sub>2</sub>SO<sub>4</sub>:

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

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

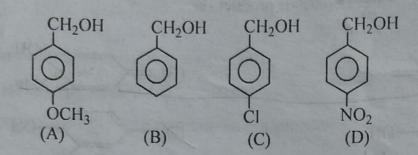
(B) 
$$Q > P > R > S$$
 (C)  $R > Q > P > S$  (D)  $R > Q > S > P$ 

$$\begin{array}{c}
OH \\
\xrightarrow{H_2SO_4} X ; X \text{ is : } \\
\Lambda
\end{array}$$

$$16, \qquad \stackrel{\text{OH}}{\longrightarrow} \stackrel{\text{H}^+}{\longrightarrow}$$

17. 
$$C = C - CH$$

Product is:



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

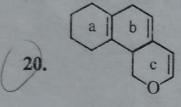
19. Which will dehydrate at fastest rate by H<sub>3</sub>PO<sub>4</sub>:

(A) 2-methyl butan-2-ol

(B) 3-methyl butan-2-ol

(C) Butan-1-ol

(D) 2-methyl butan-1-ol



The double bond which is most reactive towards electrophile:

(A) a

(B) b

(C) c

(D) None

The major product formed in the following reaction is:

$$CH_3$$
  $H_2SO_4$  heat

(A) 
$$CH_3$$
 (B)  $CH_3$  (CH)  $C$ 

CH<sub>3</sub> (D)

How many products are obtained in the given reaction:

(A) 1

(B) 2

(C)3

(D) 4

Compare rate of reaction towards pinacol pinacolone rearrangement.

- $(A) \parallel > \parallel \parallel > \parallel$
- (B) III > II > I
- (C)+1 > 1 > III
- (D) I > II > III

24. 
$$Me$$
  $Me$   $Conc.H2SO4  $A$   $A$$ 

Product A is:

What is the order of reactivity with HBr:

- (A) a > b > c
- (B) b > a > c
- (C) c > b > a
- (D) b > c > a

In the given reaction 26.

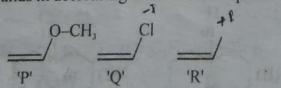
$$C_7H_{12}(X) \xrightarrow{HBr} S$$
as major product

(X) can not be:

H<sup>⊕</sup> → 'P' (Major Product)

$$(B)$$
  $\bigcirc O$ 

Arrange the following compounds in decreasing order of electrophilic addition: 28.



- (A) P > Q > R
- (B) P > R > Q
- (C) R > P > Q (D) R > Q > P

29. H 
$$\xrightarrow{C=CH_2}$$
 D  $\xrightarrow{HBr}$  Product (without rearrangement of carbocation)

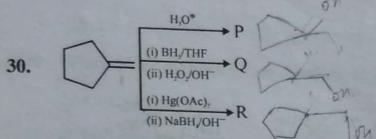
What is stereochemistry of product:

(A) Racemic mixture

(B) Optically inactive

(C) Mixture of diastereomers

(D) Meso product



Correct statement regarding products P, Q & R

(A) Product P & R are same

- (B) Product Q & R are same
- (C) P & Q are functional isomers

- (D) Product P, Q & R all are different
- 31. Select the incorrect statement about the product mixture in the following reaction:

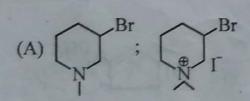
$$\xrightarrow{Br_2} Products$$

(A) It is optically active

(B) It is racemic mixture

(C) It is a resolvable mixture

- (D) It is a mixture of erythro compounds
- 32.  $(i) \xrightarrow{\text{CH}_3 I} Q$  If P & Q are the major products then P & Q are respectively:



$$(B) \bigcap_{N \to Br}; \quad \bigoplus_{N \to I} Br$$

(C) 
$$\bigcap_{N} Br$$
;  $\bigcap_{N} Br$ 

$$(D) \bigcap_{N} Br; \bigcap_{N} Br$$

33. In the given reaction:

$$\begin{array}{c}
 & \xrightarrow{H} \\
 & \xrightarrow{N} \\
 & \xrightarrow{Br_2} \\
 & \xrightarrow{R} \\
 & \xrightarrow{N} \\
 & \xrightarrow{R} \\
 & \xrightarrow{$$

$$(C) \xrightarrow{\begin{array}{c} H \\ N \\ Br \end{array}}$$

$$(D)$$
 $R_r$ 

34. In the given reaction:

$$CI$$
 $CH_3OH$ 
 $(Excess)$ 
 $(X)$  is:

$$(A) \begin{array}{c} CI \\ OCH_3 \\ OCH_3 \end{array} \qquad (B) \begin{array}{c} OCH_3 \\ OCH_3 \\ OCH_3 \end{array} \qquad (CI)$$

$$(C)$$
 $OCH_3$ 
 $OCH_3$ 
 $OCH_3$ 
 $OCH_3$ 

Which compound undergoes hydrolysis by the S<sub>N</sub>1 mechanism at the fastest rate? 35.

Arrange the following compounds in decreasing order of their reactivity for hydrolysis reaction 36.

(I) 
$$C_6H_5-CH_2-Br$$
 (II)  $C_6H_5-CH-C_2H_5$  (III)  $Br$ 

(C) 
$$III > IV > II > I$$

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

Which of the following is most reactive toward S<sub>N</sub>1 reaction.

$$(A) \bigcirc (B) \bigcirc (CH_2-CI) \bigcirc (CH_$$

Arrange the following compounds in order of decreasing rate of hydrolysis for S<sub>N</sub>1 reaction; 38.

(II) 
$$H_3C$$
— $CH_2$ — $Br$ 

(III) 
$$CH_3-CH_2-CH_2-Br \rightarrow h$$

(III) 
$$CH_3$$
- $CH_2$ - $CH_2$ - $Br \rightarrow h$  (IV)  $CH_3$   $CH$ - $CH_2$ - $Br \rightarrow h$ 

 $(A) \parallel > \parallel \parallel > \parallel \vee > \parallel$ 

(B) IV > III > II > I

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

Which one of the following compounds will give enantiomeric pair on treatment with HOH?

(A) 
$$C_6H_5 - C - I$$
  
 $C_2H_5$ 

(A) 
$$C_6H_5 - C - I$$
 (B)  $CH_3 - C - Br$  (C)  $C_6H_5 - C - Br$  (D)  $C_2H_5 - C - Br$  (C)  $C_6H_5 - C - Br$  (D)  $C_2H_5 - C - Br$  (C)  $C_4H_5 - C - Br$ 

(D) 
$$C_2H_5 - C - B_1$$
 $CH_3$ 

(I) 
$$CH_3$$
  $CH-CH-CH_3$  (II)  $C_6H_5-CH-C_6H_5$  (IV)  $CH_3$   $CH_3$   $CH_3$   $CH_3$   $CH_4$   $CH_5$   $CH_$ 

Decide decreasing order of reactivity of above alkyl halide?

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

## 41. For the given reaction

Which substrate will give maximum racemisation?

(A) 
$$C_6H_5 - C - Br$$
 (B)  $CH_2 = CH - C - Br$  (C)  $C_6H_5 - C - CH_3$  (D)  $C_6H_5 - C - CH_3$  (D)  $C_6H_5 - C - CH_3$  (E)  $C_2H_5$  (C)  $C_6H_5 - C - CH_3$  (D)  $C_6H_5 - C - CH_3$  (E)  $C_2H_3$  (E)  $C_3H_3$  (E)  $C$ 

## 42. Select incorrect statements about the product (P) of the reaction:

$$\begin{array}{c}
\text{H} & \text{Me} \\
\text{Me} & \text{H}
\end{array}$$

- (A) P is optically inactive due to internal compensation
- (B) P is optically inactive due to the presence of plane of symmetry in the molecule
- (C) The structure of P can have three optical isomers possible.
- (D) P can have four possible optical isomers.

## 43. Consider the following molecules:

$$(I) \bigcirc B_{r} \bigcirc (IV) \bigcirc B_{r} \bigcirc (IV)$$

The correct decreasing ease of hydrolysis is:

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

$$\begin{array}{c|c}
 & D \\
 & D \\
 & D \\
 & D \\
 & OH \\
 & S_{N^{1}} \\
 & ?
\end{array}$$

Major product is:

$$(A)$$
  $D$   $D$   $D$ 

$$(C)$$
  $D$ 

(D) None of these

46.

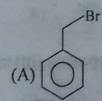
Find out the correct statement about the reaction.

- (A) Among the products 48% S and 48% R configuration containing molecules are present
- (B) Among the products 50% S and 50% R configuration containing molecules are present
- (C) Among the products 48% S and 52% R configuration containing molecules are present
- (D) Among the products 52% S and 48% R configuration containing molecules are present In the given reaction the product [P] can be:

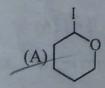
$$CH_3$$
- $CH$ = $CH$ - $CH_2$ - $OH$   $\xrightarrow{HBr}$   $P$ 

(A) 
$$CH_3$$
- $CH$ - $CH$ - $CH_2$ - $Br$  (B)  $CH_3$ - $CH$ - $CH$ = $CH_2$ 

Which of the following can not give S<sub>N</sub>1 reaction easily? 47.



Which one of the following compounds will be most reactive for S<sub>N</sub>1 reactions?





Which of the following compounds is most rapidly hydrolysed by S<sub>N</sub>1 mechanism?

(A) C<sub>6</sub>H<sub>5</sub>Cl

(B) CI-CH<sub>2</sub>-CH=CH<sub>2</sub>

(C)  $(C_6H_5)_3CCI$ 

(D) C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Cl