DPP-01

1. which of the following is not a Neutral Nucleophile.

(A) $NH_2 - NH_2$ (B) ROH (C) RCOR (D) RSH

2. Which of the following is not a Electrophile.

(A) $H_3O^{\oplus}$ (B) Hg_2^{+2} (C) $\overset{\oplus}{N}H_4$ (D) $K^{\oplus}$

3. Most Stable Carbocation is: -

(A) $H_3C-\overset{+}{C}H-CH_3$ (B) $(CH_3)_3C^{\oplus}$ (C) $\overset{\oplus}{C}H_2 - CH = CH_2$ (D) $\overset{\oplus}{C}H = CH_2$

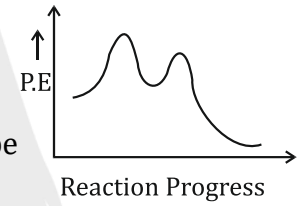
4. For the Given Reaction sequences

$$\underset{\text{(Reactants)}}{R.} \xrightarrow{T\cdot S_1} (\text{Intermediate})' \xrightarrow{T\cdot S_2} (\text{Intermediate})'' \xrightarrow{T\cdot S_3} \underset{\text{(Product)}}{S}$$

Choose the correct statement is/are:

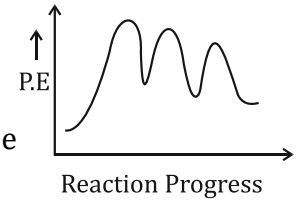
(A) Minimum Number of T.S are 3

(B) If reaction will be exothermic then the graph will be

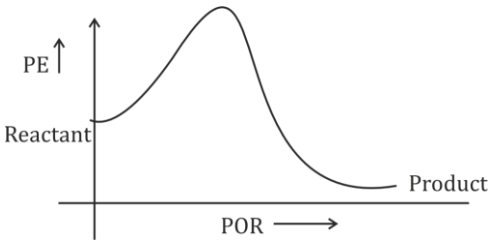


(c) Potential Energy of T. S_2 is higher then T. S_1

(D) If reaction will be endothermic then the graph will be



5. Choose the correct statement for the given Potential Energy graph.



(A) It is Exothermic Reaction Graph

(B) Its $\Delta H > 0$

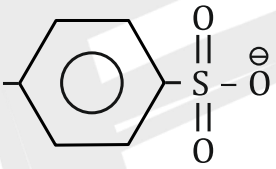
(C) In this Reaction graph net heat is evolved.

(D) It is Endothermic Reaction Graph

6. Choose the incorrect order of Nucleophilicity is.

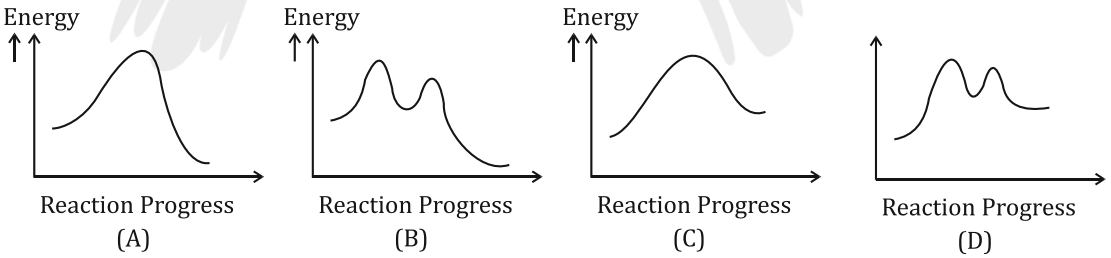
(A) $CH_3 - \overset{\ominus}{C}H_2 > CH_3 - CH_2 - \overset{\ominus}{O} > CH_3 - \overset{O}{\overset{\|}{C}} - \overset{\ominus}{O} > Ph - \overset{\ominus}{O}$

(B) $R_2NH > RNH_2 > ROR > ROH$

(C) $\overset{\ominus}{C}N > \overset{\ominus}{O} - CH_3 > CH_3 - \overset{O}{\overset{\|}{C}} - \overset{\ominus}{O} > H_3C$  $> \overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}} - \overset{\ominus}{O}$

(D) $\overset{\ominus}{O}H > CH_3 - \overset{\ominus}{O} > \overset{\ominus}{N}H_2 > CH_3\overset{\ominus}{C}OO$

7. The Graphs below represents energy Vs Reaction coordinate diagrams. using the diagrams to Answers the Questions below.



(A) Which Reaction (s) corresponds to a two-step mechanism_____.

(B) Which Reaction (s) corresponds to a one step mechanism_____.

(C) Which Reaction (s) corresponds to a exothermic Reaction_____.

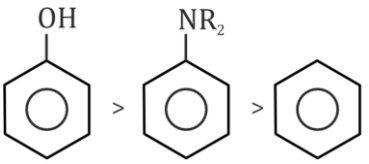
(D) Which Reaction (s) corresponds to a endothermic Reaction_____.

(E) Which Reaction (s) have Intermediates_____.

8. Which of the following order is correct.

(A) $CH_3 - CH = CH_2 > CH_2 = CH_2 \longrightarrow$ (Nucleophilicity order)

(B) $\overset{\ominus}{O} - OH > \overset{\ominus}{O}H > H_2O \longrightarrow$ (Nucleophilicity order)

(C)  (Nucleophilicity order)

(D) $\overset{\oplus}{N}O_2 > CO_2 > BCl_3 \longrightarrow$ (Electrophilicity order)

9. Which of the following statement is / are correct

(A) Structure of carbocation is planer due to sp^2 hybridization

(B) Carbon free radical is act as Both Lewis acid or Lewis's base

(C) Carbanion have complete octet.

(D) Carbon free radical is doublet Intermediate.

(E) Carbanion is singlet Intermediate.

(F) Carbocation is act as Lewis's acid.

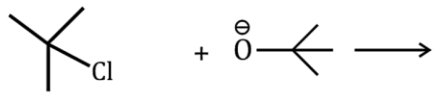
(G) Carbanion is act as a Nucleophile.

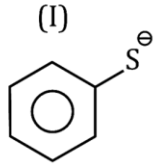
10. Total number of complete octet electrophiles are:

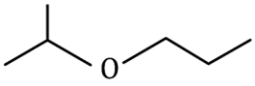
(i) $AlCl_3$ (ii) $I - Cl$ (iii) $Br - Cl$ (iv) $R - \overset{\overset{O}{\|}}{C} - X$

(v) BF_3 (vi) BCl_3 (vii) $\begin{matrix} R \\ H \end{matrix}\!\!>\!O$ (viii) $R - \overset{\overset{O}{\|}}{C} - R$

11. Label the nucleophile and electrophile in the reactants for the given Reactions sequences.

(A)  (I) + (II) ⟶

(B)  (I) + CH_3-Br ⟶ (II)

(C)  (I) + H – I ⟶ (II)

(D) $RO^{\ominus}$ +  ⟶

(I) (II)

(E) R – OH + PCl_5 ⟶

(I) (II)

12. Total number of soft nucleophiles are

$\overset{\ominus}{H}$, $\overset{\ominus}{D}$, $\overset{\ominus}{I}$, $\overset{\ominus}{N}R_2$, $\overset{\ominus}{F}$

R_3P, R – $\overset{\ominus}{Se}$, $\overset{\ominus}{N}H_2$, $\overset{\ominus}{R}S$, $\overset{\ominus}{O}R$, $Br^{\ominus}$

ANSWER KEY

1. (C) **2.** (D) **3.** (B) **4.** (A,D) **5.** (A,C) **6.** (A,D)

7. (a) ⇒ (B), (D); (b)→(A), (C); (c)→(A), (B); (d)→(C), (D); (e)→(B), (D)

8. (A,B)

9. (A,C,D,E,F,G) **10.** 4

11. (A) $(I) \rightarrow (E), (II) \rightarrow (Nu^{\ominus})$ (B) $(I) \rightarrow (Nu^{\ominus}), (II) \rightarrow (E)$

(C) $(I) \rightarrow (Nu^{\ominus}), (II) \rightarrow (E)$ (D) $(I) \rightarrow (Nu^{\ominus}), (II) \rightarrow (E)$

(E) $(I) \rightarrow (Nu^{\ominus}), (II) \rightarrow (E)$

12. 5