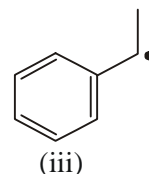


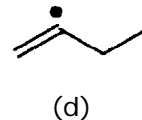
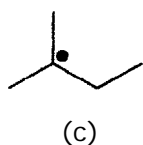
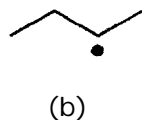
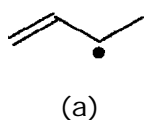
## FREE-RADICALS

**Q.1** The relative stability of :



- (A)  $i > ii > iii$     (B)  $i > iii > ii$     (C)  $ii > i > iii$   
(D)  $ii > iii > i$     (E)  $iii > ii > i$

**Q.2** Rank the free radicals below from the most stabilized to the least stabilized :



- (A)  $a > c > b > d$                       (B)  $c > a > b > d$   
(C)  $c > d > a > b$                       (D)  $a > d > c > b$   
(E)  $d > a > c > b$

**Q.3** The most stable free radical among the following is

- (A)  $C_6H_5CH_2\dot{C}H_2$     (B)  $C_6H_5\dot{C}HCH_3$     (C)  $CH_3\dot{C}H_2$     (D)  $CH_3\dot{C}HCH_3$

**Q.4** The central carbon atom of a free radical contains

- (A) 6 electrons                      (B) 7 electrons  
(C) 8 electrons                      (D) None of the above

**Q.5** Among the following, the paramagnetic species is

- (A) Free radical                      (B) Carbonium ion  
(C) Carbanion                      (D) All the three above

**Q.6** A free radical is a chemical species which is

- (A) Electron rich but neutral  
(B) Electron rich but negatively charged  
(C) Electron deficient but neutral  
(D) Electron deficient but positively charged

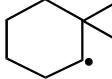
**Q.7** The shape of free radicals is

- (A) Planar      (B) Pyramidal      (C) Tetrahedral      (D) Linear

**Q.8** Which of the following is the most stable free radical ?

- (A)  $(\text{CH}_3)_3\dot{\text{C}}$       (B)  $\text{CH}_3\dot{\text{C}}\text{H}_2$       (C)  $(\text{CH}_3)_2\dot{\text{C}}\text{H}$       (D)  $\dot{\text{C}}\text{H}_3$

**Q.9** Which of the following radical will rearrange

- (A)  $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \dot{\text{C}}\text{H}_2$       (B)  $\text{CH}_3 - \overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}} - \dot{\text{C}}\text{H}_2$
- (C)  $\text{CH}_3 - \underset{\text{Cl}}{\text{CH}} - \dot{\text{C}}\text{H}_2$       (D) 

**Q.10** How many different alkyl radicals can form by hydrogen abstraction in the following reaction ?



- (A) 3      (B) 4      (C) 5      (D) 6      (E) 7

### ANSWER KEY

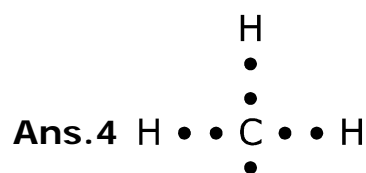
<b>Q.No.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Ans.</b>	E	A	B	B	A	C	A	A	C	B

## SOLUTIONS (FREE-RADICALS)

**Ans.1** (iii) is the conjugated free-Radical (F.R.) so it is most stable  
 (ii) ( $3^\circ$  F.R.) > (i) ( $2^\circ$  F.R.)

**Ans.2** Stability of order of free radical  
 allylic >  $3^\circ$  >  $2^\circ$  > vinylic

**Ans.3** (B) is in conjugation with  $-\text{C}_6\text{H}_5$  group.

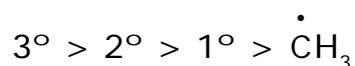


**Ans.5** Free-radical contains one unpaired electron.

**Ans.6** Free radical has only 7 electrons, its octet is not complete so it is electron deficient. It has no charge so it is Neutral.

**Ans.7** Free radical has  $sp^2$  hybridisation.

**Ans.8** Order of stability



Above order can be explained on the basis of Hyperconjugation & Inductive effect.

Stability  $\propto$  Hyperconjugation.  
 $\propto$  Inductive effect.

**Ans.9** Free radicals seldom rearranges but if halogen atom is present, it can undergoes rearrangement to form more stable free radical.

**Ans.10** Four different free radicals are -

