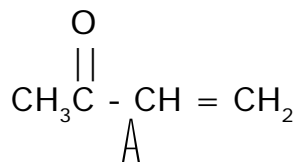


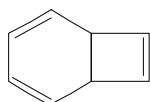
HYBRIDISATION

Q.1 The bond identified (with the arrow) in the structure shown is best described as :



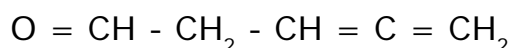
- (A) $sp-sp^2$ (B) p-p (C) sp^2-sp^3
 (D) sp^2-sp^2 (E) p-p

Q.2 The compound shown has $sp^2 - sp^2$ (sigma) bonds.



- (A) 1 (B) 3 (C) 4
 (D) 5 (E) 6

Q.3 Select the response that correctly identifies the number of carbon atoms of each hybridization in the compound shown :



- | | | | | | | | |
|-----|--------|--------|------|-----|--------|--------|------|
| | sp^3 | sp^2 | sp | | sp^3 | sp^2 | sp |
| (A) | 1 | 3 | 1 | (B) | 1 | 4 | 0 |
| (C) | 2 | 3 | 0 | (D) | 2 | 2 | 1 |

Q.4 The bonds between carbon atom (1) and carbon atom (2) in compound



- (A) sp^2 and sp^2 (B) sp^3 and sp (C) sp and sp^2 (D) sp and sp

Q.5 Which of the following has all carbon atoms sp -hybridized ?

- (A) $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$ (B) $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$
 (C) $\text{HC} \equiv \text{C} - \text{C} \equiv \text{CH}$ (D) All the three above

SOLUTIONS (HYBRIDISATION)

Ans.1 Carbon bearing double bond is sp^2 -hybridised single bond is formed by σ overlapping.

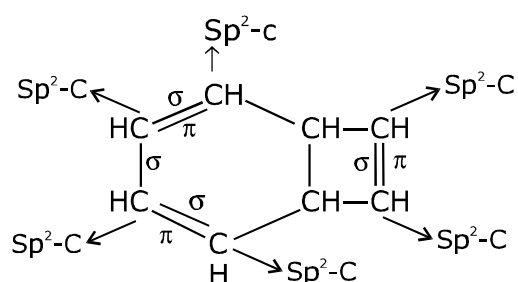
Ans.2 For organic molecules use formula

$$n = \text{no. of lone pairs} + \text{no. of } \sigma \text{ bonds on that atom.}$$

$$\text{if } n = 2 \quad sp$$

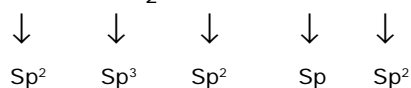
$$n = 3 \quad sp^2$$

$$n = 4 \quad sp^3$$



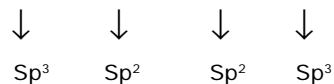
In case of double bond, one bond is σ which is formed by overlapping of sp^2 -orbital while other bond is π formed by overlapping of pure-p-orbital.

Ans.3 $O = CH - CH_2 - CH = C = CH_2$

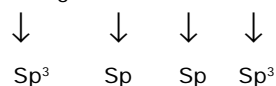


Ans.4 Carbon bearing Two double bond [=C=] or Triple bond [C≡C] is sp -hybridized while carbon bearing double bond is sp^2 hybridized.

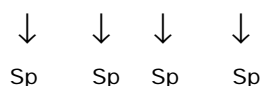
Ans.5 (A) $CH_3 - CH = CH - CH_3$

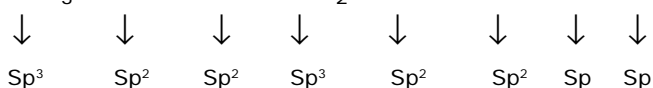
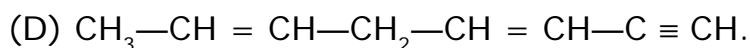
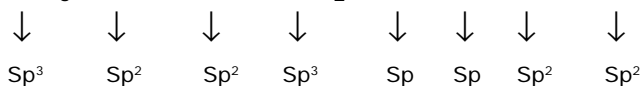
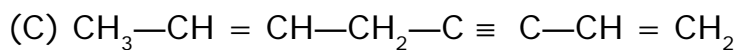
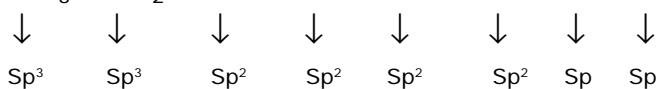
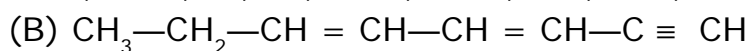
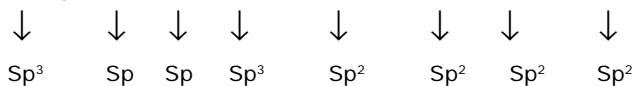
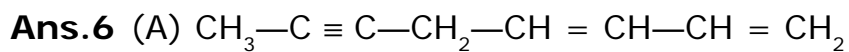


(B) $CH_3 - C \equiv C - CH_3$



(C) $HC \equiv C - C \equiv CH$

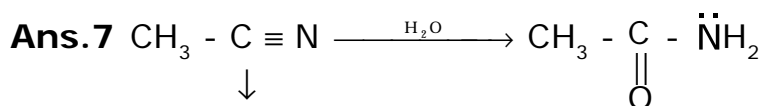




(Double bonded Carbon)

Sp^2

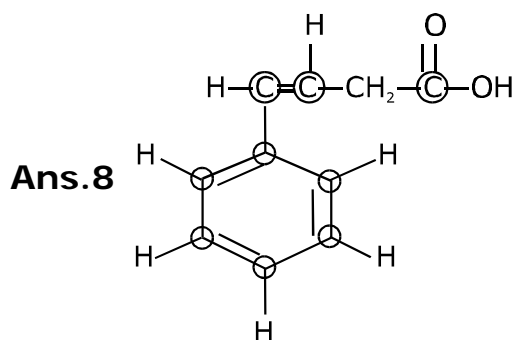
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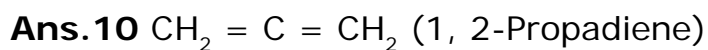
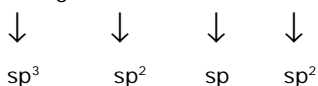
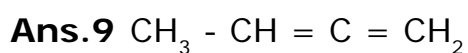
Sp

(Triply bonded Carbon)



* All circled 'C' are sp^2 hybridised

* Carbon without circled is sp^3 hybridised



\downarrow

sp