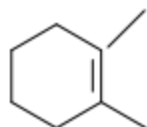


CHAPTER - 09
**ORGANIC CHEMISTRY - SOME BASIC PRINCIPLES
AND TECHNIQUES - PART II**
**(FUNDAMENTAL CONCEPTS IN ORGANIC REACTION
MECHANISM)**

SECTION - I

1. 1 C–C bonds in benzene acquire partial double bond character due to resonance
2. 2 C–C single bond in propene is shorter than that in alkanes due to hyperconjugation
3. 1 BF_3 , CH_3I and CH_3CHO are electrophiles
4. 1 Amines are better nucleophiles than alcohols due to lower electronegativity of N
5. 3 Order of stability of carbocations and free radicals is $3^\circ > 2^\circ > 1^\circ$. Order of stability of carbanions is $3^\circ < 2^\circ < 1^\circ$
6. 3 Most stable - 1
Least stable - 3
7. 3 Presence of $-\text{NO}_2$ at para position enhances stability of the anion
8. 4 General order of acid strength is
Carboxylic acids > phenol > water > alcohol > terminal alkyne > alkene > alkane
9. 1 Order of stability is : $a > b > d > c$
(a) has no charge separation : (c) has positive charge on oxygen atom
10. 3 Reaction (III) is a substitution reaction and it involves a rearrangement as well
11. 8 Compounds 1, 2, 6, 8, 9, 10, 11 and 12 are aromatic
12. 3 Compounds 2, 3 and 5 are more acidic than phenol

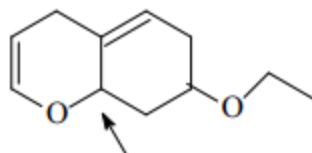
13. 3 Compounds 1, 7 and 8 are less basic than $\text{N}(\text{CH}_3)_3$
14. 4 Statements 1, 2, 3 and 4 are correct
15. 6 The given carbocation has six α -H atoms
16. (D) 3-methoxyphenol is more acidic than phenol
17. (B) Order of basicity of anions is, $\text{CF}_3\text{SO}_3^- < \text{CH}_3\text{SO}_3^- < \text{ACO}^- < \text{MeO}^-$
 \therefore order of leaving groupability is, $\text{CF}_3\text{SO}_3^- > \text{CH}_3\text{SO}_3^- > \text{AcO}^- > \text{MeO}^-$
18. (B) In $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_3$, $-\text{CH}_2-$ group is flanked on both sides by electron-withdrawing groups and hence its hydrogens are most acidic. Once a carbanion is formed, it is stabilised due to resonance.
19. (C) -I effect on $-\text{COOH}$ group is lowest in (c). Thus, (c) is the weakest acid (lowest dissociation constant)
20. (A) Order of acid strength is, $\text{CH}_3\text{CH}_3 < \text{NH}_3 < \text{CH} \equiv \text{CH} < \text{H}_2\text{O}$
 \therefore order of base strength is, $\text{CH}_3\overset{(-)}{\text{C}}\text{H}_2 > \overset{(-)}{\text{N}}\text{H}_2 > \text{CH} \equiv \text{CO} > \text{OH}^{(-)}$
21. D C_2-C_3 bond has partial double bond character due to resonance. Thus, bond length lies between 1.34 \AA and 1.54 \AA (Bond length of normal C-C bond is 1.54 \AA and normal C=C is 1.34 \AA)
22. B In (B) like charges are close to each other
23. A III has partial double bond character due to resonance. Thus, C-N bond length in III lies between that in I and II
24. BCD Compound (B), (C) and (D) are more acidic than H_2CO_3 , thus they can react with NaHCO_3
25. (BD) (B) and (D) are basic, thus dissolves in dil HCl
26. BD Compounds (B) and (D) are more acidic than H_2O , thus deprotonated with NaOH
27. BC (B) and (S) are antiaromatic
28. A, B, C, D



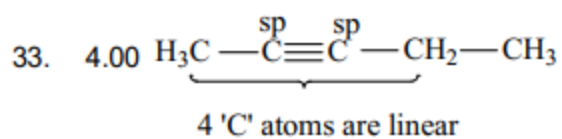
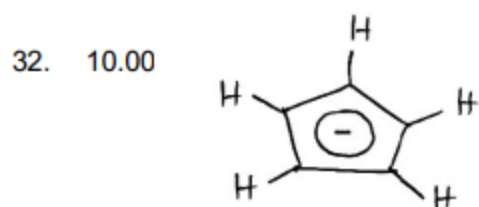
is more stable than (A), (B), (C) and (D)

29. ACD Stability of $\text{CH}_3-\overset{\text{CH}_3}{\underset{\oplus}{\text{C}}}-\text{OCH}_3$ is greater than that of $\text{CH}_3-\overset{\oplus}{\text{CH}}(\text{CH}_3)-\text{CH}_2-\text{OH}$

30. 1.00 Out of the four C-O bonds, only the indicated C-O bond gives rise to allylic carbocation



31. 2.00 1 and 3 are collar



34. 3.00 Aniline has five resonance structures whereas anilinium has only two resonance structures

