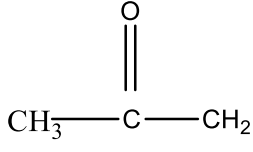
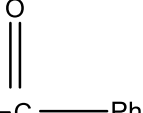


TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
V SEMESTER INTERNAL ASSESSMENT I EXAMINATIONS
CHEMISTRY QUESTION BANK

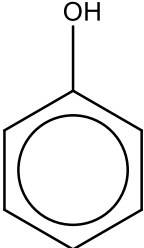
I. Fill in the blanks

1. $I_a = 0, I_b = I_c \neq 0$ for Linear molecules
2. Movement of inertia of spherical top molecules are $I_a = I_b = I_c$
3. Example for unsaturated compounds $\pi - \pi^*$ transist
4. Compounds of Hetero atoms show $n - \pi^*$ transition

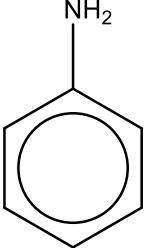
5. Examples of equivalent protons $CH_4, CH_3 - CH_3,$ 
6. Example for Non-Equivalent protons $CH_3 - CH_2 - Br$
7. In which element having (M+2) peak Cl
8. In Acetaldehyde Two (2) types of protons are present
9. 108 M/e of $CH_3 - CH_2 - Br^+$

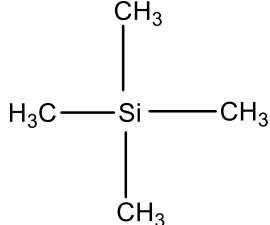
10.  M/e =

11. Examples of HCl, CO, NH_3, H_2O
12. IR frequency of carbonyl compounds $1650-1850cm^{-1}$

13.  $\lambda_{max} = \underline{283 \text{ nm}}$

14. The increasing order of electronic transactions $\sigma - \sigma^* > n - \sigma^* > \pi - \pi^* > n - \pi^*$

15.  $\lambda_{max} = \underline{270 \text{ nm}}$

16. TMS 

17. Zero (0) is the chemical shift of TMS NMR spectroscopy

18. In ethyl acetate no. of 3 sets protons are present

19. $\text{CH}_3\text{-CH}_2\text{-Cl}^+$ $M/e = \underline{64}$
20. n-Butanol M/e value are _____
21. Chemical shift = $U(\text{Sample}) - U(\text{Reference})/U(\text{Instrument})$
22. Moment of inertia molecules are classified into 4
23. Example for $n-\pi^*$ transition unsaturated with lone pair electrons
24. Transmittance formula $(T) = I_t/I_0$
25. Beer-Lambert's law $I = I_0 \cdot e^{-kct}$
26. Monochromatic light type of light used for Beer & Lambert's Law
27. For Lambert's law the decrease in intensity of light is directly proportional to Thickness (pathlength) of solution
28. λ_{max} of α, β - unsat, Ketone 215 nm
29. All unsaturated groups are chromophores
30. $I_A \neq I_B \neq I_C$ are Asymmetric top molecules
31. Energy difference between two successive energy levels are $\Delta\varepsilon = \Delta\bar{\nu} = 2B(J+1)$
32. Rotation constant $B = \frac{h}{8\pi^2 IC}$
33. Number of molecular orbitals produced are equal to no. of Atomic orbitals mixed
34. As the E.N increases Chemical shift proton also increases
35. M/Z of M^+ peak is equal to molecular weight of compound
36. Splitting of nmr-signal is due to spin-spin coupling process
37. Spin multiplicity of proton = $n + 1$
38. No. of neighboring protons(n) for $-\text{CH}_3^C$ is 3
39. 3 sets of protons present in ethyl acetate
40. UV band towards longer wave length (or) right side of spectrum called Red shift

II. Short Questions

1. What are the advantages of spectroscopic methods?

- A: i) The sample required for spectroscopic analysis is very less
ii) Highly sensitive methods
iii) Time required for structure determination is very less
iv) Accurate results are obtained
v) Sample recovery is possible and which is used for another time

2. Define rotational axis?

A: The axis passes through the centre of the body/molecule around which the molecule can take infinite number of rotation is called rotational axis

3. Define Chromophore?

A: The group which is responsible for absorption of uv-visible range of radiation

4. What is transmittance(T)?

A: The ratio of intensity of transmitted light (I_t) to the intensity of incident light (I_0) is called transmittance

$$T = \frac{I_t}{I_0}$$

5. Explain Beer's Law?

A: When a monochromatic light is passed through a solution, the decrease in the intensity of light is directly proportional to concentration of solution

$$I = I_0 e^{-kc}$$

6. Explain about equivalent protons?

A: Protons which possess same chemical environment and similar to chemical shift values are called equivalent protons

7. Define chemical shift?

A: The change in position of nmr signal when compared with reference compound due to shielding (or) deshielding effect of protons.

$$\text{Chemical shift} = U_{(\text{sample})} - U_{(\text{Reference})} / U_{\text{Instrument}}$$

8. Explain about ^1H NMR spectra of Ethyl Bromide?

A: $\text{CH}_3\text{-CH}_2\text{-Br}$ 2-sets of proton a & b
-CH₃ ----- n = 2 from n+1 2+1 = 3 (Triplet)

9. What is Molecular ion peak?

A: Peak resulting from molecular ion of a sample is called molecular ion peak

10. Explain about mass spectrum of ethyl bromide?

A: $\text{CH}_3\text{-CH}_2\text{-Br}$ m/z = 108

Molecular ion is formed by removal of 1 electron from Br-atom by bombarding with electron beam. Later heterolysis of c-Br bond gives $\text{CH}_3\text{-CH}_2$ (m/z = 29) and $\overset{\cdot}{\text{Br}}$ fragment ethyl carbocation further heterolysis gives CH_3^{\oplus} and CH_2