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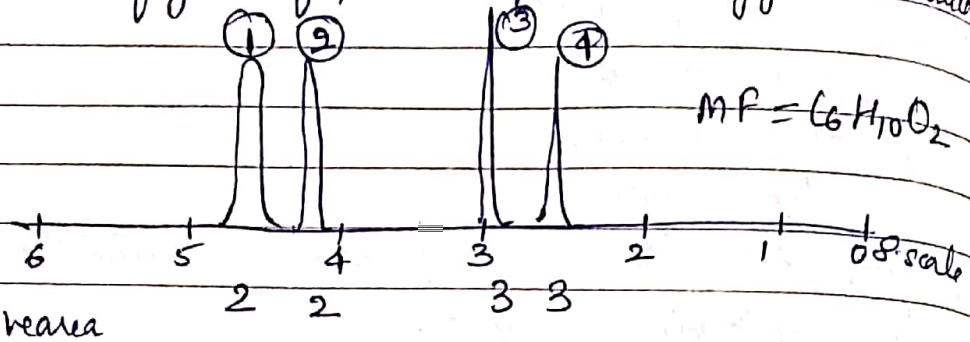
① Draw the proton spectra for below mentioned compound -

$CH_3-\overset{O}{\overset{\|}{C}}-OCH_2CH_3$ (a)

$CH_3O-\overset{O}{\overset{\|}{C}}-CH_2CH_3$. (b)

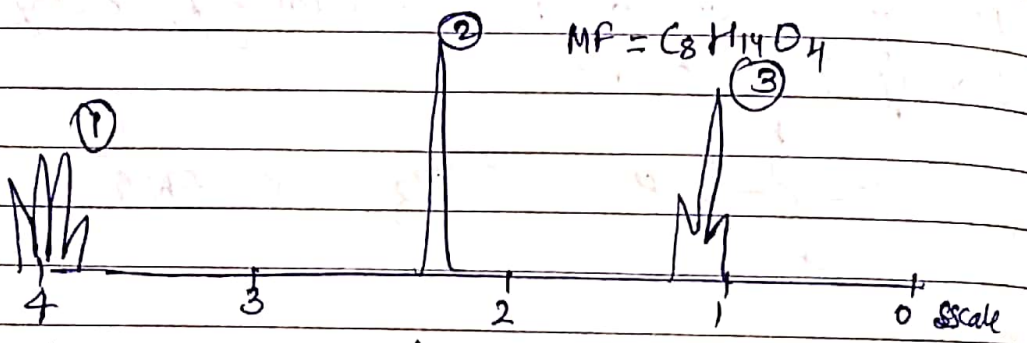
② Given the figure of proton spectra. Suggest its structure.

a)



B →

b)



B →.

Ques3 Proton spectra of an aromatic compound $C_{12}H_{14}O_4$ shows following peaks.

i) triplet at $\delta = 8.62$ for 4 protons, ratio of 1:2:1

ii) Quartet at $\delta = 5.65$ for 4 protons, ratio of 1:3:3:1

iii) Singlet at $\delta = 1.98$ for 6 protons, ratio

Q4. What are activators and antioxidants used during process of vulcanization of Rubber? Give one example of each.

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(5) Cis-1,2-Dichloroethylene shows C=C-stretching absorption in its IR spectrum whereas trans-1,2-dichloroethylene doesnot show C=C-stretching. Give reason.

(6) Why TMS is chosen for reference compound in NMR spectroscopy?

(7) Compare the proton spectrum of ordinary (Impure) ethanol and pure ethanol. Give reason for difference.

(8) Explain why aldehydic protons appear much downfield in Proton spectrum?

(9) C=O stretching in IR of acetone comes at 1720 cm^{-1} while C=O stretching in acetamide comes at 1680 cm^{-1} give reasons?

(10) Give the mechanism involved when vinyl chloride is polymerised in presence of benzoyl peroxide?

(11) How is polyester synthesized. Also give the synthesis of its monomer units?

(12) List of the following group of monomers in order of decreasing ability to undergo anionic polymerisation Given reason for your answer.

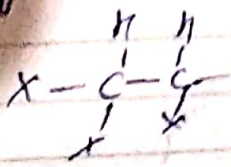
1) $CH_2=CH-CH_3$
2) $CH_2=CH-Cl$
3) $CH_2=CH-CN$

(17) An organic compound A with MF: C_8H_8O gave following UV:- λ_{max} 242 nm ε_{max} 16.
IR shows imp bands at 2862 (w) and 1928 cm^{-1} (s)
NMR: δ 2.8 (2H, d), 7.22 (5H, s); 9.7 (1H, t)
explain the UV, IR and NMR data, draw the structure of compound?

(14) Explain with example:-
a) Mordant dyes
b) Thermoplastics
c) Edible dyes — ?

(15) Differentiate b/w chromophore and auxochrome by taking suitable example.

(16) Draw high resolution NMR spectrum of following compound showing J value also:-



$J = 7$ Hz. X = EWG

(17) What is the significance of polydispersity index? (Next class)

(18) State the condition for changes taking place in the following:-

Leucobase ⇌ colour Base ⇌ Dye.

(19) How will you differentiate b/w CH≡CH and $CH_3CH_2CH_2CH_2CH{\equiv}CH$

(20) Calculate the approximate wave number of fundamental absorption peak due to the stretching vibration of O-H group.
force const for O-H grp = 7.7×10^5 dyne/cm.
Reduced mass = $9.41 \times 1.67 \times 10^{-24}$ gm.

(21) An organic compound with MF - $C_6H_{12}O$ showed the following data :-
UV: (λ_{max}) 258 nm, ε = 24
IR very strong band at 815 cm^{-1}
NMR: δ 2.0 (3H, s), 1.0 (9H, s)
i) Calculate double bond equivalent.
ii) UV transition.
iii) IR absorption band.
iv) NMR peaks along with splitting pattern.