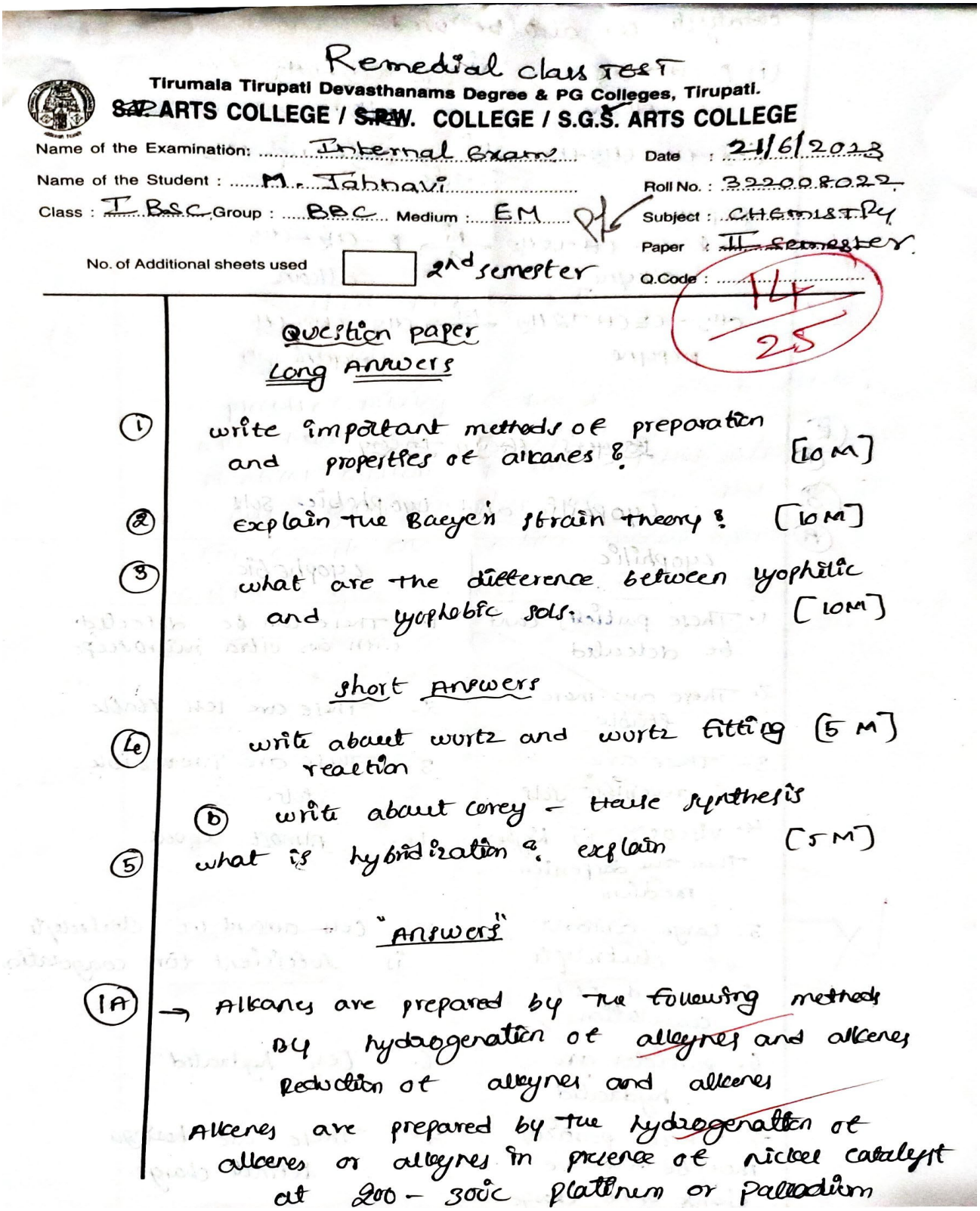
5.Additional assignments and Tests

As a part of remedial work the students are given additional tests and assignments to reinforce the concept learnt in the class and improve performance in the university examinations.



Remedial class TEST

Tirumala Tirupati Devasthanams Degree & PG Colleges, Tirupati.

~~S.V.~~ ARTS COLLEGE / ~~S.R.W.~~ COLLEGE / S.G.S. ARTS COLLEGE

Name of the Examination: Internal Exam Date : 21/6/2023

Name of the Student : M. Jahnavi Roll No. : 322008022

Class : I BSC Group : BBC Medium : EM Subject : CHEMISTRY

No. of Additional sheets used ☐ 2nd semester Paper : II ~~semester~~

Q.Code :

14/25

Question paper

Long Answers

(1) write important methods of preparation and properties of alkanes? [10 M]

(2) Explain the Baeyer's strain theory? [10 M]

(3) what are the difference between lyophilic and lyophobic sols. [10M]

Short Answers

(4a) write about wurtz and wurtz fitting reaction [5 M]

(b) write about corey - House synthesis

(5) what is hybridization? explain [5 M]

"Answers"

(1A) → Alkanes are prepared by the following methods

By hydrogenation of alkynes and alkenes

Reduction of alkynes and alkenes

Alkenes are prepared by the hydrogenation of alkenes or alkynes in presence of nickel catalyst at 200 - 300°C platinum or palladium

catalyst

(i) $R-CH=CH_2 + H_2 \xrightarrow{Ni} R-CH_2-CH_3$

Alkene → Alkane

$CH_3-CH=CH_2 + H_2 \xrightarrow[200-300^\circ C]{Ni} CH_3-CH_2-CH_3$

propane

$R-C\equiv CH + 2H_2 \xrightarrow[\Delta]{Ni} R-CH_2-CH_3$

alkyne → alkane

$CH_3-C\equiv CH + 2H_2 \xrightarrow{Ni} CH_3-CH_2-CH_3$

propyne → propane

6

~~Bacyer's~~ ~~Lecithin~~ ~~Theory~~

Lyophilic and Lyophobic sols

Lyophilic	Lyophobic
1. These particles can't be detected	1. These can be detected with an ultra microscope
2. These are more stable	2. These are less stable
3. These are reversible sols	3. These are irreversible sols.
4. viscosity is higher than the dispersion medium	4. Almost equal
5. Large amount of electrolyte is needed for coagulation	5. ~~Less amount of electrolyte~~ is sufficient for coagulation
6. particles are hydrated	6. Less hydrated
7. These particles may be +ve -ve charge or no charge	7. These are having definite charge.

In some cases 8. Depending on the charge they show electrophoresis	8. These shows electrophoresis

Short Answer 5 M

(5)

Hybridization

The process of mixing of two more atomic orbitals with nearly equal energy to give no. of identical orbitals is called hybridization.

*. This gives the shape of the molecule for example one s orbital overlap with 3p orbital to give four sp^3 hybride orbitals

→ The shapes of the molecules on the basis of hybridization follows.

Type of hybridization	No of outer orbitals	Shape Linear	
sp	2	Linear	—
sp2	3	plane triangle	△
sp3	4	Tetrahedral	
dsp3	4	square planar	
sp^3d	5	Trigonal bipyramid	
sp^3d^2	6	octahedral	
$sp3d3$	7	pentagonal bi pyramid	

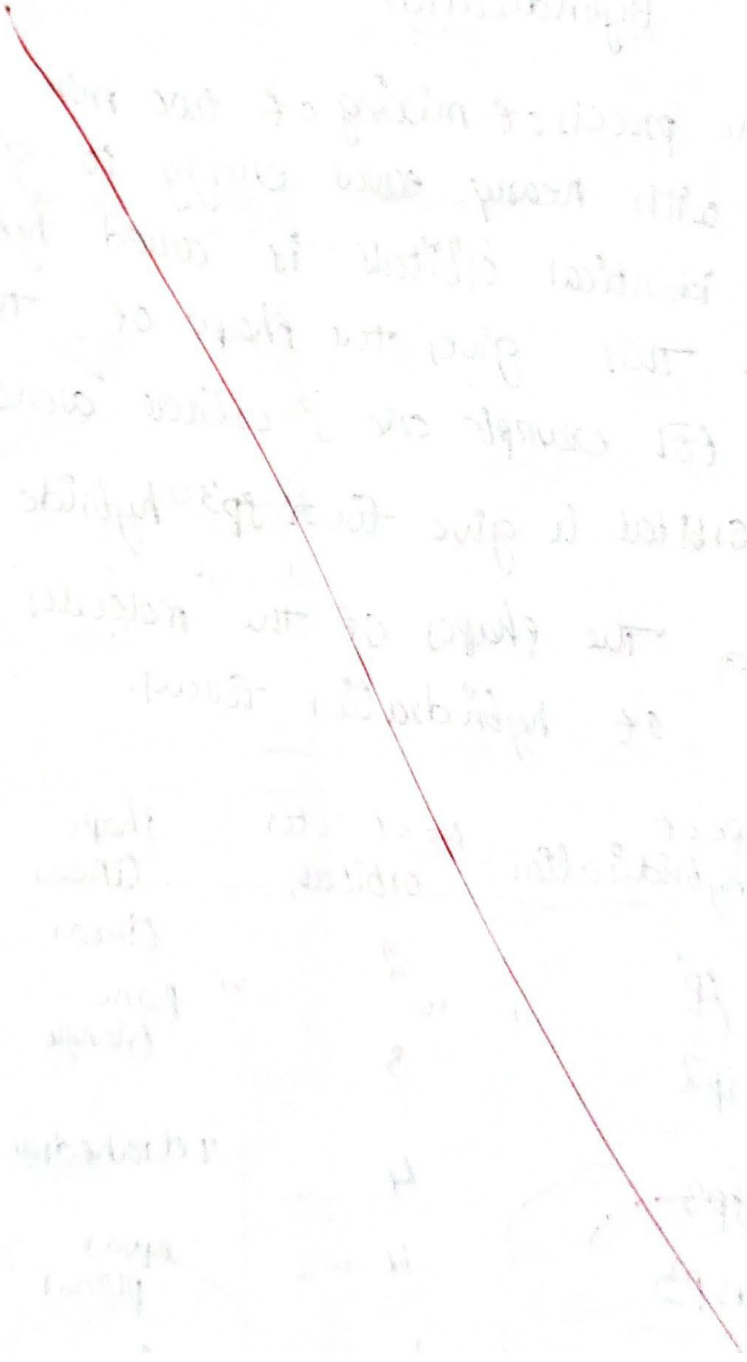
4

Some points to remember about hybridization

1- only orbitals undergo hybridisation not electrons

2- The molecules are stable because of hybridization

3- The electrons present with opposit spins in hybrid orbitals.



Remedial class test

Tirumala Tirupati Devasthanams Degree & PG Colleges, Tirupati.

S.V. ARTS COLLEGE / ~~S.V.~~ COLLEGE / S.G.S. ARTS COLLEGE

Name of the Examination: Internal Exam Date : 06/07/2023

Name of the Student : T. kushwanth Roll No. : 321008040

Class : II CBZ Group : BBC Medium : E.M Subject : CHEMISTRY

Paper : IV semester - IV Pape

No. of Additional sheets used ☐ Q.Code :

15/25

IV Semester

Course - IV

Long Answer questions 10 m

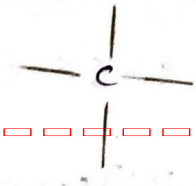
1. What are organometalic compounds? Discuss their classifications on the bassic of types of bonds with examples.
2. What are amaino acids? write any three general method of preparation amina acides.
3. i) Explain Ruff's degradation.
   ii) explain kiliani-fischer synthesis.

Short answers 5 m

4. Desive heat capacities and derive $C_p - C_v = R$
5. What are epimers and anomers.

Answers

(1.A) The compounds in which a metal atom is bonded in bonded directly to a carbon of hydrocarbon are celled organo metallic compounds.



(M = Li, Na, K, Zn, Cd, Hg ....)

Ex:- CH_3Li, CH_3MgCl, $(CH_3)_2Cd$, $(C_2H_5)_4Pb$

The following acetatates and alkoxides are not belonging to OMC category.

Ex:- CH_3-ONa, $CH_3-COONa$, CaC_2...

Nomenclature:-

CH_3Li - methyl lithium

C_2H_5-Li - ethyl lithium

$(C_2H_5)_4Pb$ - tetra ethyl lead

C_2H_5-MgBr - Ethyl manesium bromide

C_6H_5-Li - Phenyl lithium.

Classification:-

OMC's are classified into simple OMC's and mixed OMC's.

(i) Simple OMC's:- The OMC's in ~~symmetric~~ which metal atom is bonded with same alkyl groups

Ex:- CH_3Li $(C_2H_5)_2Mg$, C_6H_5-Li, $(C_2H_5)_4Pb$

These are classified in to symmetric and asymmetric oms's

(ii) Mixed OMC's:- These are formed by alkyl and other groups attached to the metal

Ex:- CH_3MgCl, C_6H_5-MgBr $(CH_3)_2SiCl_2$, $(CH_3)_2Si(OH_2)$

Classification of OMC's based on OMGS:-

Based on bond type OMC's are classifid in to four types

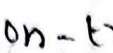
(i) Ionic OMC's (ii) Covalent OMC's

(iii) π-bonded OMC's (iv) Bridge bonded oma's

(i) Ionic OMC's :- The OMC's of hight electro positive metals are ionic in nature

Ex :- $Na-C\equiv C-Na$,  $Na^{\oplus}$, $CH_3^{\ominus}\ Li^{\oplus}$

(ii) Covalent OMC's :- lower electro positive metals and non-transition metals form covalent

Ex :- $(CH_3)_2Zn$, $(C_2H_5)_4Pb$,  $SiCl_3$

(iii) π-bonded OMC's :- Especially transition metals form this type of compounds.

Eg :- ferocene which has band which structure

$(C_5H_5^-)$ $(C_5H_5^-)_2Ru$

(iv) Bridge bonded OMC's :- OMC's which are having bridging alkyl grop is conected to both.

Ex :- $Al_2(CH_3)_6$ CH_3

(Q.A) Compound having both amino ($-NH_2$) and carboxy ($-COOH$) groups with in the same molecule are called Amino acids.

They are usually classfied into α, β, γ etc.. according to relative positions of the two functional groups.

Ex :- $CH_3-\overset{\alpha}{C}H(NH_2)-COOH$ α-Amino acid

$\overset{\beta}{C}H_2(NH_2)-\overset{\alpha}{C}H_2-COOH$ β-Amino acid

$\overset{\gamma}{C}H_2(NH_2)-\overset{\beta}{C}H_2-\overset{\alpha}{C}H_2-COOH$ γ-Amino acid

(1) Essentil Amino acids:- The amino acids which are not synthsised in the body at a rate necessary for normal growth are called Essential aminoacids they are supplied in the diete.

Among the 25 natural amino acids essentatial amino acids are 10.

Ex :- Valine, Leucine, Isoucine, Lysine..

6

(2) Non essential amino acids:- The amino acids whic are synthesised in the body are called non-essential amino acid. Thes is.

(5.A) Epimers differ in the position of the atoms attached at one chiral carbon. Anomers differ in position at the anomeric carbon, they ar a special type oof epimr. 5m

The α form of glucose has the anomeric OH group opposite from the CH_2OH group. While the β from has the anomeric OH group on the same side as the CH_2OH group.

3

Remedial Internal class test - II

Tirumala Tirupati Devasthanams Degree & PG Colleges, Tirupati.

~~S.V.~~ ARTS COLLEGE / ~~S.V.W.~~ COLLEGE / S.G.S. ARTS COLLEGE

Name of the Examination: Internal Exam

Name of the Student : B. Pavan Kalyan

Class : II B.Sc Group : CBZ Medium : Eng

No. of Additional sheets used

Date : 22-05-2023

Roll No. : 321008048

Subject : CHEMISTRY

Paper : IV semester Paper 5

Q.Code :

Questions

13/25 25 Marks

(1) Explain the following
(a) Cannizaros reaction — 10M
(b) perkin's Reaction

(2) write a note on energy level of simple harmonic oscilator and an harmonic Oscilator? — 10M

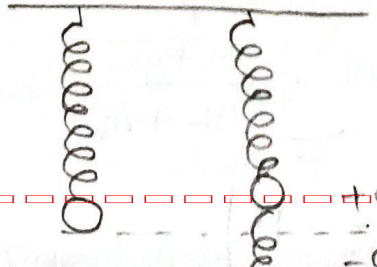
(3) Explain about splitting of ~~of~~ Signal & Spins in Coupling. — 10M

(4) write any two methods of preparation of carbony compounds? — 5M

(5) write the applications of IR Spectroscopy? — 5M

Answers

2A) The vibrations of abond can be compared with classical harmonic Oscillator in which a ball is attached to a spring.



When a force (f) is applied the ball moves from its rest position. when the ball involves up the restoring force acts on it then the spring undergo stretching.

The restoring force $f \propto -d$.

$$f = -kd \quad \text{.....(1)}$$

K is propotionality constant.

d is displacement of ball

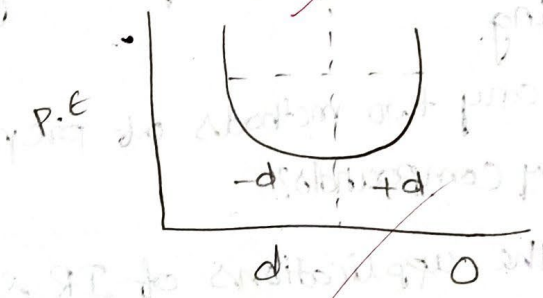
Equation (1) is called Hook's law the potential energy of the oscillator.

$$V = \frac{1}{2} kd^2$$

Kinetic energy $K.E = \frac{1}{2} mv^2$

Total Energy $E = \frac{1}{2} kd^2 + \frac{1}{2} mv^2$

The potential energy for various d. values is as follows.



$$V = 1/2\pi \sqrt{\frac{K}{m}}$$

If 2 balls are linked with one another like two atoms of a molecule then the frequency

$$V = \frac{1}{2\pi} \sqrt{\frac{K}{\frac{m_1 + m_2}{m_1 + m_2}}}$$

where $\left[\frac{m_1 m_2}{m_1 + m_2} = \mu\right]$

$$= \frac{1}{2\pi}\sqrt{\frac{k}{\mu}}$$

$$\epsilon_{v_n} = \left[v + \tfrac{1}{2}\right] h\nu$$

$$\nu = \tfrac{1}{2}\sqrt{\frac{k}{m}}$$

$$\nu = \tfrac{1}{2\pi}\sqrt{\frac{k}{\frac{m_1 m_2}{m_1 + m_2}}}$$

$$\epsilon_v = \left(v + \tfrac{1}{2}\right) h\nu_{osc} \text{ Joules.} \quad v = \text{Vib. quantum no.}$$

$$\epsilon_v = \frac{\epsilon_v}{hc} = \left(v + \tfrac{1}{2}\right) \bar{\nu}_{osc} \ cm^{-1} \quad (v = 0, 1, 2, 3 \cdots)$$

3A) In NMR Spectrum each signal represents one kind of proton or group of identical protons. But in many cases instead of single peak, a group of peaks observed. This is called Splitting of Signals.

(i) for example ethyl bromide $CH_3^a CH_2^b$, for in this case two types of protons are present protons of CH_3 and proton.

(ii) CH_2 hence two peaks are expected But a triplet for protons and a quarter for CH_2 protons are observed.

Spin - spin coupling :-

Splitting depends upon the environment of the proton with respect to the other proton. Spin of proton couple with those of adjacent group.

(i) ↑↑ Reinforcing
(ii) ↑↓ not effective
(iii) ↓↓ opposing

} External field.

CH_3 is developed with intensity ratio 1:1:1.

Similarly, the spin of the proton ($-CH_3$) can couple with adjacent methyle group in four ways in external field.

(i) ↑↑↑ Strongly reinforcing

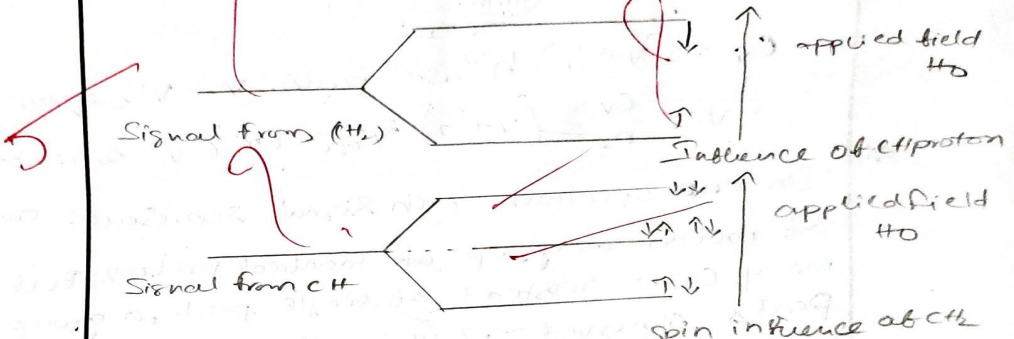
(ii) ↑↑ ↓↑ ↓↑ ↓↑↑ weakly reinforcing

(iii) ↓↑ ↓↑↓ ↑↓↓ weakly opposing

(iv) ↓↓↓ Strongly opposing.

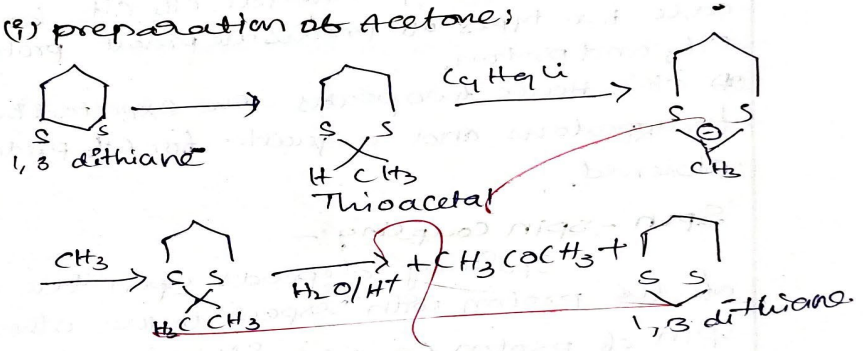
External field.

Signal is split into doublet.



Signal is split into a Triplet.

(4A) (i) preparation of Acetone:



(ii) from nitriles. (2) Grignard reagents:

$CH_3MgCl + HCN \xrightarrow[H^+]{H_2O} CH_3CHO$

Ex: $RMgX + HCN \xrightarrow{H_2O/H^+} R-OH$

Grignard reagent is reacted with HCN & then on hydrolysis to form aldehyde.

Picture 1 : Conducting study hours for remedial Students