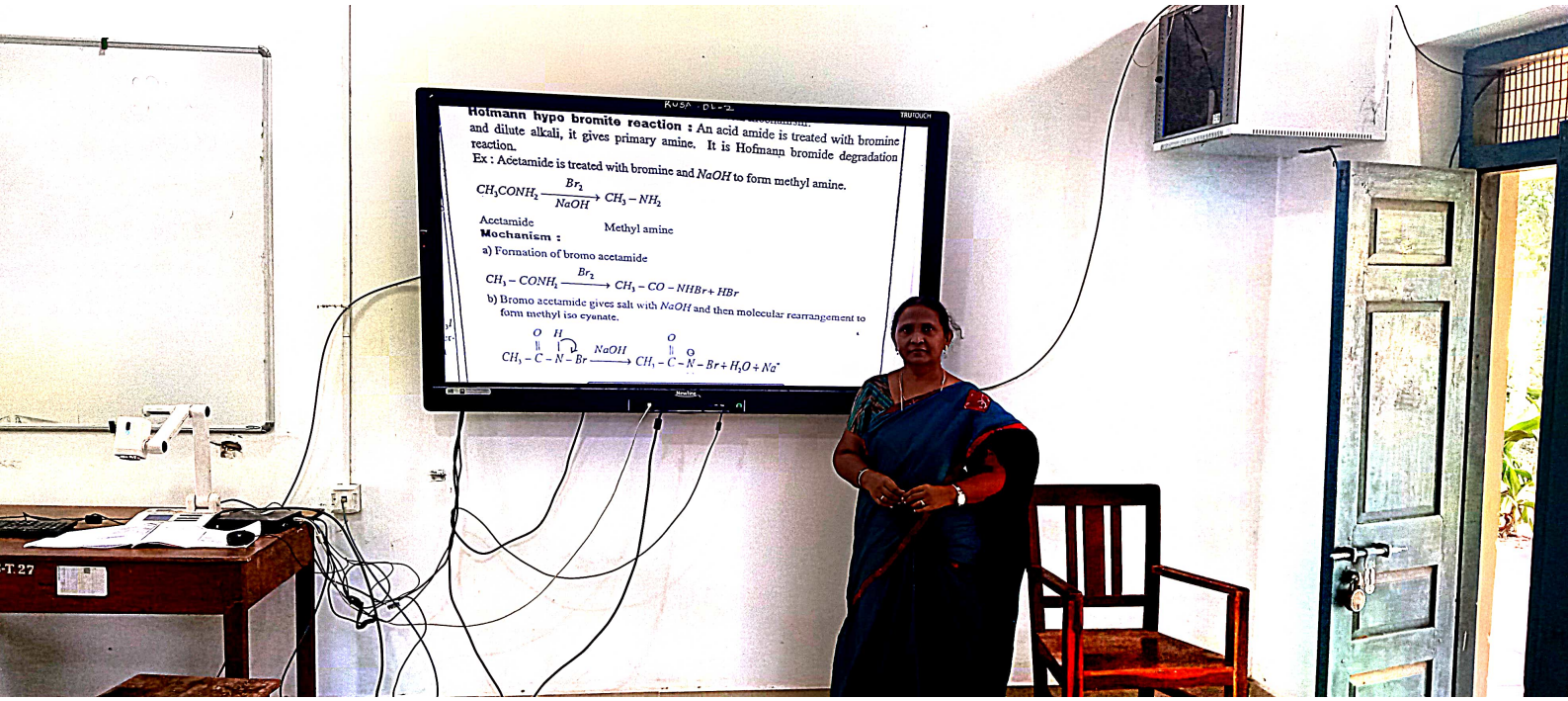
SKR Govt Degree College
Gudur

Department of chemistry

ICT Record

Academic year - 2021-22

S No	Topic	Name of the student	Signature of the student
1	Hofmann degradation	A Vishnu	A. Vishnu
		B. Neeraja	B. Neeraja
2	Hofman hypo-bromite reaction	G. Narendra	G. Narendra
		K Bhavana	K. Bhavana
3.	Aldol condensa-tion	L Suneel	L. Suneel
4.	Nef reaction	Y. Revathi	Y. Revathi
		Ch. Jagadeesh	Ch. Jagadeesh
5.	Mannich reaction	P. Indumati	P. Indumati
6.	Quantum yeild	A. Venu	A. Venu
7	steric effect in benzene	K. Mahesh	K. Mahesh
		D. Bhavani	D. Bhavani
8	MO diagram of nitric oxide	T Srihari	T. Hari


RUSA - PL-2
TRUTOUCH
Hofmann hypo bromite reaction : An acid amide is treated with bromine and dilute alkali, it gives primary amine. It is Hofmann bromide degradation reaction.
Ex : Acetamide is treated with bromine and NaOH to form methyl amine.
$CH_3CONH_2 \xrightarrow[NaOH]{Br_2} CH_3 - NH_2$
Acetamide
Methyl amine
Mechanism :
a) Formation of bromo acetamide
$CH_3 - CONH_2 \xrightarrow{Br_2} CH_3 - CO - NHBr + HBr$
b) Bromo acetamide gives salt with NaOH and then molecular rearrangement to form methyl iso cyanate.
$CH_3 - \overset{O}{\overset{\|}{C}} - \overset{H}{N} - Br \xrightarrow{NaOH} CH_3 - \overset{O}{\overset{\|}{C}} - N - Br + H_2O + Na^+$
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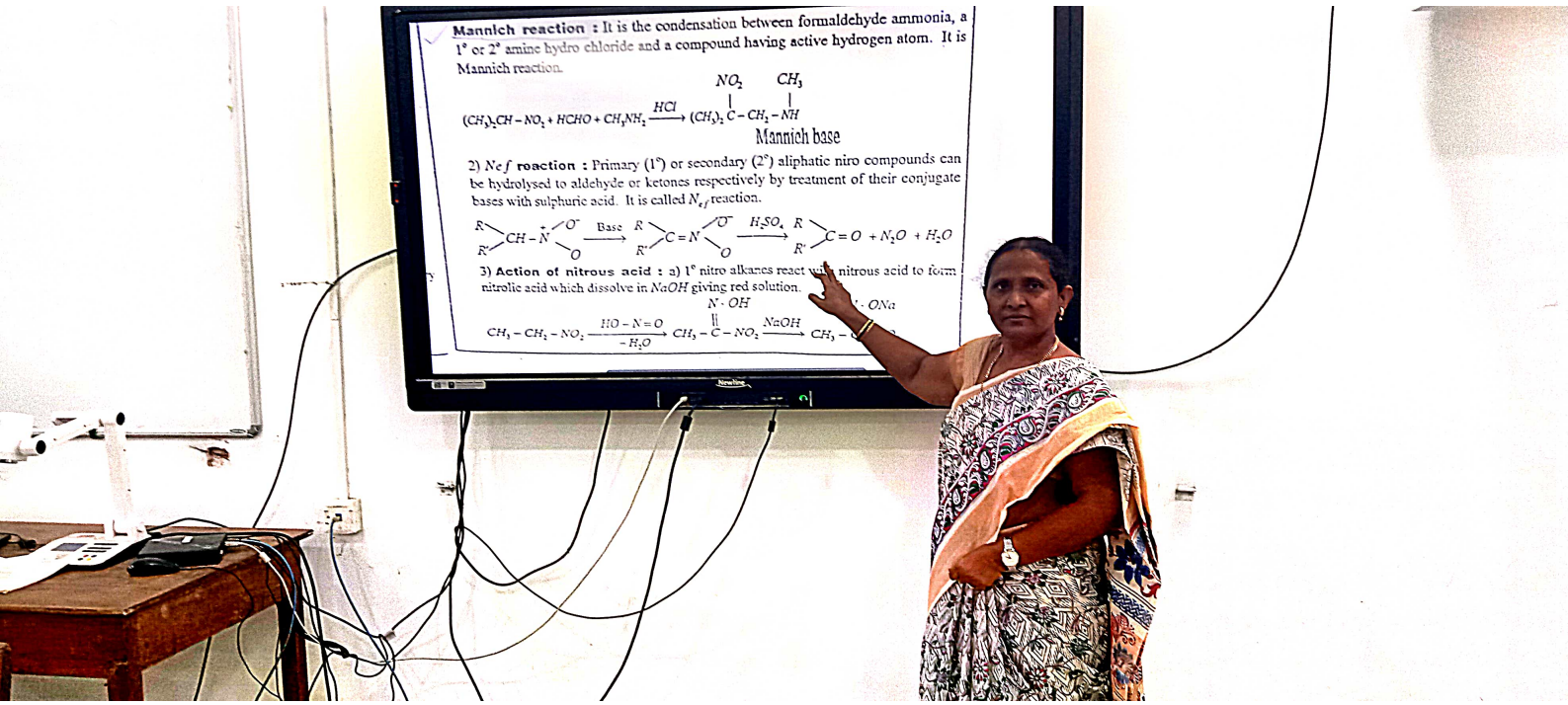
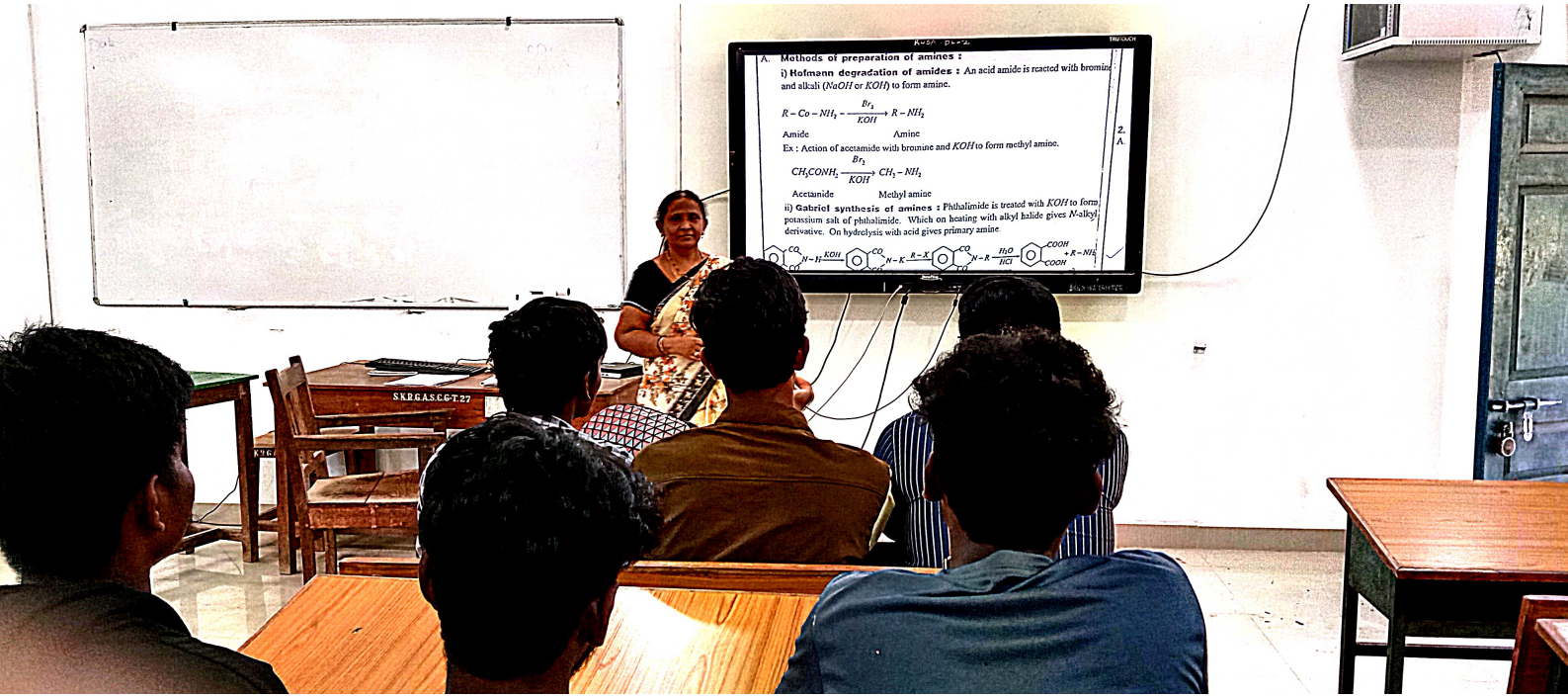

Mannich reaction : It is the condensation between formaldehyde ammonia, a 1° or 2° amine hydro chloride and a compound having active hydrogen atom. It is Mannich reaction.
$(CH_3)_2CH-NO_2 + HCHO + CH_3NH_2 \xrightarrow{HCl} (CH_3)_2\underset{\displaystyle NO_2}{\underset{|}{C}}-CH_2-\underset{\displaystyle CH_3}{\underset{|}{NH}}$
Mannich base
2) Nef reaction : Primary (1°) or secondary (2°) aliphatic nitro compounds can be hydrolysed to aldehyde or ketones respectively by treatment of their conjugate bases with sulphuric acid. It is called N_{ef} reaction.
$\underset{R'}{\overset{R}{\diagdown}}CH-N\overset{O^-}{\underset{O}{\diagup}} \xrightarrow{Base} \underset{R'}{\overset{R}{\diagdown}}C=N\overset{O^-}{\underset{O}{\diagup}} \xrightarrow{H_2SO_4} \underset{R'}{\overset{R}{\diagdown}}C=O + N_2O + H_2O$
3) Action of nitrous acid : a) 1° nitro alkanes react with nitrous acid to form nitrolic acid which dissolve in NaOH giving red solution.
$CH_3-CH_2-NO_2 \xrightarrow[-H_2O]{HO-N=O} CH_3-\underset{\displaystyle N\cdot OH}{\underset{\|}{C}}-NO_2 \xrightarrow{NaOH} CH_3-\underset{\displaystyle N\cdot ONa}{\underset{\|}{C}}-NO_2$


A. Methods of preparation of amines :
i) Hofmann degradation of amides : An acid amide is reacted with bromine and alkali (NaOH or KOH) to form amine.
$R-Co-NH_2 \xrightarrow[KOH]{Br_2} R-NH_2$
Amide Amine
Ex : Action of acetamide with bromine and KOH to form methyl amine.
$CH_3CONH_2 \xrightarrow[KOH]{Br_2} CH_3-NH_2$
Acetamide Methyl amine
ii) Gabriel synthesis of amines : Phthalimide is treated with KOH to form potassium salt of phthalimide. Which on heating with alkyl halide gives N-alkyl derivative. On hydrolysis with acid gives primary amine.
2. A.
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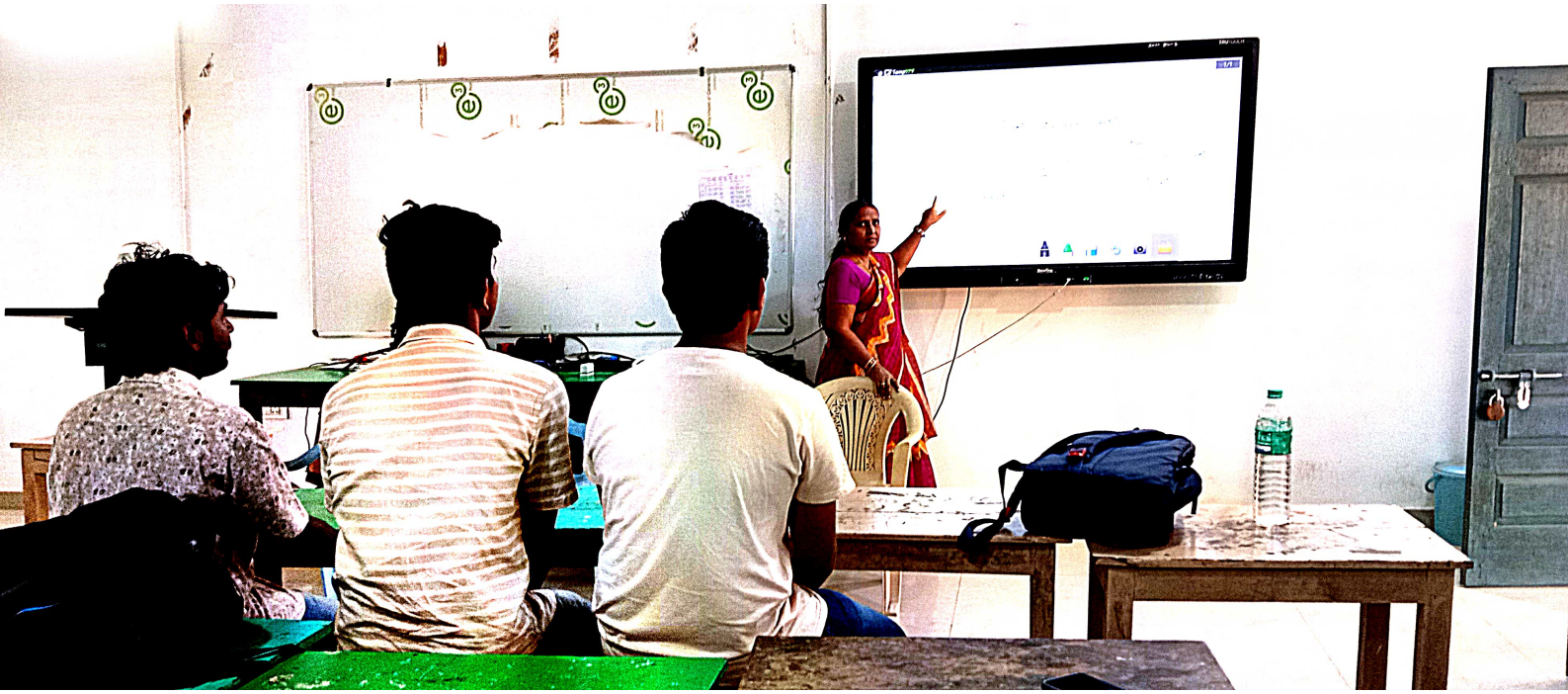
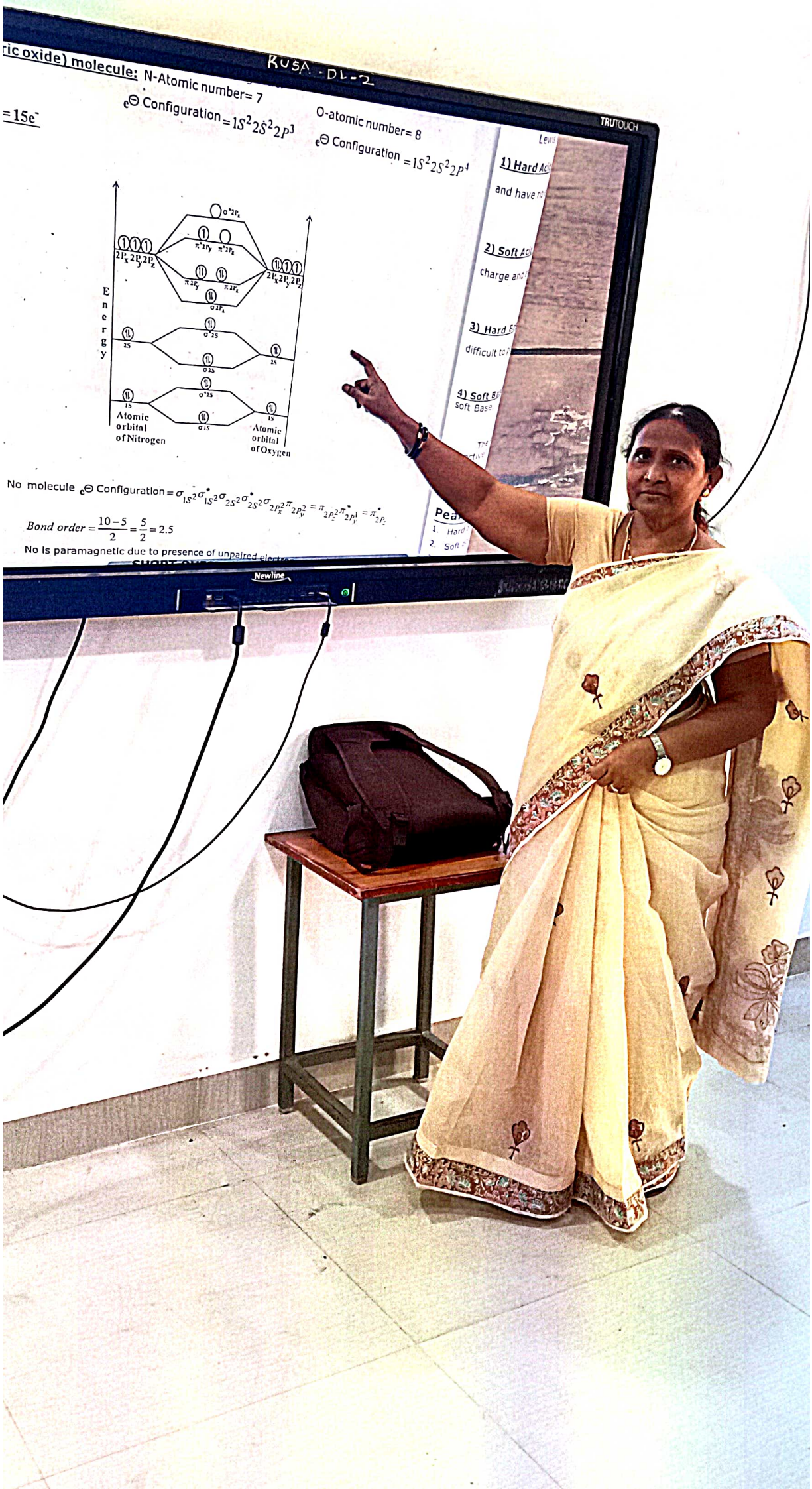
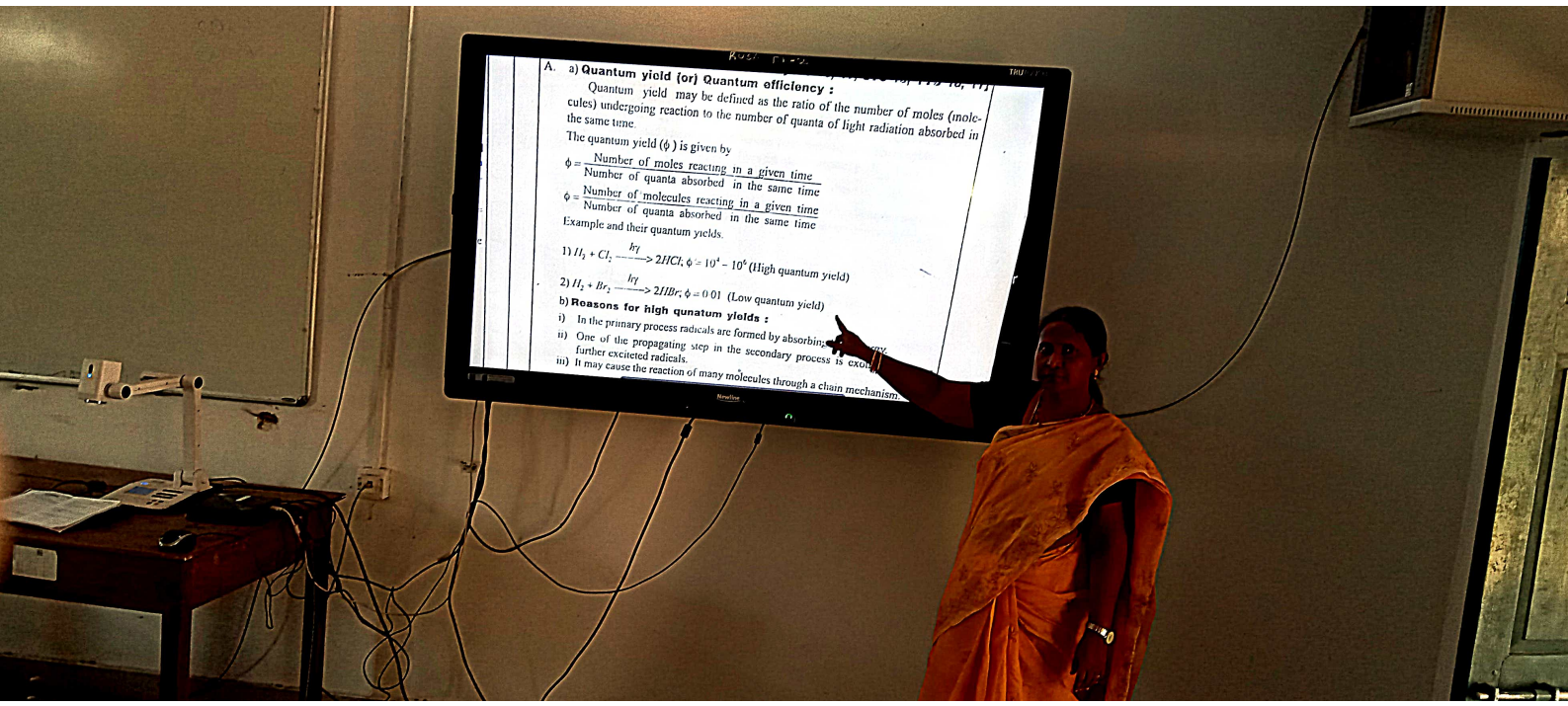



RUSA - DL-2
TRUTOUCH
ric oxide) molecule: N-Atomic number= 7
$e^{\ominus}$ Configuration $= 1S^2 2S^2 2P^3$
O-atomic number= 8
$e^{\ominus}$ Configuration $= 1S^2 2S^2 2P^4$
=15e⁻
Energy
Atomic orbital of Nitrogen
Atomic orbital of Oxygen
No molecule $e^{\ominus}$ Configuration $= \sigma_{1S^2}\sigma^*_{1S^2}\sigma_{2S^2}\sigma^*_{2S^2}\sigma_{2P_x^2}\pi_{2P_y^2}\pi_{2P_z^2} = \pi^*_{2P_y^1} = \pi^*_{2P_z}$
$Bond\ order = \frac{10-5}{2} = \frac{5}{2} = 2.5$
No is paramagnetic due to presence of unpaired electr
Newline


A.
a) Quantum yield (or) Quantum efficiency :
Quantum yield may be defined as the ratio of the number of moles (molecules) undergoing reaction to the number of quanta of light radiation absorbed in the same time.
The quantum yield (ϕ) is given by
$\phi = \frac{\text{Number of moles reacting in a given time}}{\text{Number of quanta absorbed in the same time}}$
$\phi = \frac{\text{Number of molecules reacting in a given time}}{\text{Number of quanta absorbed in the same time}}$
Example and their quantum yields.
1) $H_2 + Cl_2 \xrightarrow{h\gamma} 2HCl$; $\phi = 10^4 - 10^6$ (High quantum yield)
2) $H_2 + Br_2 \xrightarrow{h\gamma} 2HBr$; $\phi = 0.01$ (Low quantum yield)
b) Reasons for high qunatum yields :
i) In the primary process radicals are formed by absorbing
ii) One of the propagating step in the secondary process is exot
further excieteted radicals.
iii) It may cause the reaction of many molecules through a chain mechanism.