VAAGDEVI DEGREE & P.G COLLEGE

Kishanpura, Hanamkonda, Warangal

Index

STUDENT ASSIGNMENTS

S.No	Department
1	BIOTECH
2	CHEMISTRY
4	ENGLISH
5	MICROBIOLOGY
6	PHYSICS & ELECTRONICS
7	ZOOLOGY
8	FOOD SCIENCE AND NURITION
9	ZOOLOGY

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Kishanpura, Hanamkonda

DEPARTMENT OF FOOD SCIENCE AND QUALITY CONTROL
AND
DEPARTMENT OF NUTRITION AND DIETETICS

(FOOD AND NUTRITION DEPARTMENT)

Report on Students' Assignments for the Academic Year 2023-24

Introduction The Department of Food and Nutrition assigned a series of academic tasks to students during the academic year 2023-24. These assignments were designed to enhance students' understanding of core concepts, develop their analytical skills, and encourage independent learning in the field of food and nutrition.

Objective The primary objective of these assignments was to deepen students' knowledge of food and nutrition topics through research-based and application-oriented tasks, preparing them for academic excellence and practical challenges.

Details of the Program

- **Duration:** Assignments were given throughout the academic year 2023-24.
- **Participants:** Undergraduate and postgraduate students of the Department of Food and Nutrition.
- **Approach:** Individual and group assignments requiring research, analysis, and presentations.

Types of Assignments The assignments covered a broad spectrum of topics, ensuring comprehensive learning. Below are some examples of the assignments:

Assignment Topic	Description
Nutritional Assessment Techniques	Preparing a report on methods used to assess nutritional status.
Dietary Guidelines for Special Groups	Designing diet plans for children, pregnant women, and elderly individuals.
Food Label Analysis	Evaluating nutritional labels of various food products.
Emerging Trends in Food Technology	Researching advancements in food processing and preservation.
Case Studies on Clinical Nutrition	Analyzing dietary interventions for specific health conditions.
Sustainable Food Practices	Proposing strategies to promote sustainability in food consumption.
Functional Foods and Nutraceuticals	Exploring the health benefits and market trends of functional foods.

Impact of the Assignments

- Enhanced critical thinking and research capabilities.
- Fostered a deeper understanding of theoretical and practical aspects of food and nutrition.
- Improved written and oral communication skills through detailed reports and presentations.
- Encouraged collaboration and peer learning in group assignments.

Conclusion The assignments conducted for the academic year 2023-24 were a vital component of the learning process for food and nutrition students. These tasks not only reinforced academic knowledge but also cultivated skills necessary for future career paths. The Department of Food and Nutrition will continue to integrate such engaging and impactful assignments in upcoming academic sessions.

WHEAT MILLING AND ITS By-PRODUCTS

M. Pavan
Istyr-food Science

products and byproducts of wheat milling process

Abstract

Wheat crop is India's prime most staple harvest, placed second to rice. It is mostly consumed in the north west parts of the country. Since it is rich in protein, vitamin and carbohydrate it provides a blanced diet to the consumer. wheat milling is the process of grinding whole wheat grain and is converted into flour. wheat flour is the most important ingredient in home baking and is the frame work for almost every commercially baked products and pasta.

Introduction:-

Wheat is a farinaceous grass, known botanically as triticum spp., is one of the most consumed cereal grains world wide and make up a substantial part of the human diet. It provides more nourishment for humans than any other single food crops. According to statista 2013/14 the global production volume of wheat amounted approximately 710 million metric tons, which has shown a 7.7% increment from the previous year. It is the second most important food crop in the developing world after rice. Ethiopia & South Africa are the Two major producers.

Morphology & composition of wheat:-

Wheat grains are generally oval shaped, although different types of wheat have grains that range from almost spherical to long, narrow & flattened shapes. The grain is usually between 5 and 9mm in length, weighs between 35 & 50 mg and has a crease down one side where it was originally connected to the wheat flower. The wheat grain contains 2-3% germ, 13-17% bran & 80-85% mealy endosperm. products will have different coarseness, textures, and color depending on the portion of the wheat kernel. The function of the endosperm is to provide energy for the embryonic plant during germination of the wheat.

ASSIGNMENT - 2

Technology of Sugar confectionary & Chocolate processing

ASSIGNMENT-1

TECHNOLOGY OF CEREALS, LEGUMS AND OIL SEEDS

CORN

K. Sirichandana

Corn (maize)

*Introduction :-

→ Scientific name of corn is Zea mays.

→ Maize referred to as corn in North America.

→ Maize originated in central Mexico in around 5,000 BC.

→ The crop was introduced to Europe in sixteenth Century, from where it spread to Africa and Asia.

→ It is now one of the most widely-grown crops around the world both temperature and tropical regions.

→ The crop is rich in vitamin c and other vitamins and minerals, as well as carbohydrates and dietary fibre.

→ It is particalarly important source of nutrition, supplying a high energy density of 365 kcal/100g.

→ Maize has become a staple food in many parts of the world, consumed directly by human, maize is also used for corn ethanol, animal feed and other products, such as corn starch and syrup.

→ Corn are used varieties for animal feed, various corn-based human food uses (grinding into cornmeal or masa, pressing into corn oil, and fermentation

COURSE: NDBC (EM)

S.no	HALLTICKET.NO	STUDENT NAME	STUDENT SIGNATURE
1	086223251	CHERUKURI JAHNAVI	Ch. Jahnavi
2	086223252	DANAMPELLI NARENDRA	D. Narendra
3	086223253	DEVAKARI SANTHOSHINI	D. Santhoshini
4	086223254	FARHEEN	Farheen
5	086223255	GANGOJULA BHAVANI	G. Bhavani
6	086223256	KHANSA FATHIMA	K. Fathima
7	086223257	SUMAIYA ANAM	S. Anam
8	086223258	SURAM KAVYA	S. Kavya
9	086223259	SYEDA NAUSHEEN FATIMA	S. Nausheen Fathima
10	086223260	TAHERA FATIMA	T. Fatima

COURSE: NDBZ (EM)

S.no	HALLTICKET.NO	STUDENT NAME	STUDENTS SIGNATURE
1	086223651	AKARAPU POOJITHA	A. Poojitha
2	086223652	BOLLEPALLI SATHWIKA	B.
3	086223653	CHETKURI SATHWIKA	C. Sathwika
4	086223654	FAREEHA NAZ	
5	086223655	KALVAKUNTLA NAVYA BHAVANA	K.
6	086223656	KAMPELA PRADEEP	K. Pradeep
7	086223657	KURRA SOUMYA	K.
8	086223658	MACHARLA AKSHITHA	M.
9	086223659	MANDHA PRATHYUSHA	M.
10	086223660	PABBATHI AKHILA	P.
11	086223661	SILUVERU PRAVEEN KUMAR	S. Praveen Kumar
12	086223662	SOWMYA LINGNABOINA	S. Linga
13	086223663	MOHAMMED SUMAYA	M. Sumaya

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III Semester Nominal Rolls 2023-24

Course: FSBC (EM)

S.no	Admin No	HT NO	Student Name	Student Signature
1	23-3-1217	086233201	BANOTHU SIMHADRI	B. Simhadri
2	23-3-1201	086233202	BHUKYA ANIL	Anil
3	23-3-1207	086233203	BOLLA ASHWITHA	B. Ashwitha
4	23-3-1208	086233204	CHELAGOLA SRAVANI	Sravani
5	23-3-1212	086233205	ELLANKI VAMSHI	Vamshi
6	23-3-1218	086233206	GADIGOPPULA ARAVIND	G. Aravind
7	23-3-1203	086233207	KARRE NANDINI	K. Nandini
8	23-3-1209	086233208	MATURI VINAY	Vinay
9	23-3-1214	086233209	NALLELLA NAGARAJU	Nagaraju
10	23-3-1205	086233210	PESARU POORNIMA	P. Poornima
11	23-3-1204	086233211	SADULA NITHYA SRI	S. Nithyasri
12	23-3-1215	086233212	SHEELALA ANIL	S. Anil

Course: FSMIC (EM)

S.no	Admin No		Student Name	Student Signature
1	23-3-1403	086233851	ANATHULA KRISHNA SAI	A Krishnasai
2	23-3-1406	086233852	GURRAM NIHARIKA	G. Niharika
3	23-3-1405	086233853	MADINENI AKHILA	M. Akhila
4	23-3-1404	086233854	SURABOINA GANESH	S. Ganesh.

Msc Food Science and Technology

	Roll No.	Name of the Student	Signature
1.	2311753001	B. Himavarsha	B. Himavarsha
2.	2311753002	G. Navya Sree	Navya Sree
3.	2311753003	C. Akhila	Akhila
4.	2311753004	R. Divyasree.	Divya
5.	2311753005	Y. Manohar	Manohar.
6.	2311753006.	MD. Reshma.	MD. Reshma.
7.	2311753007.	R. Devana.	R. Devana
8.	2311753009.	K. Kalpana.	Kalpana
9.	2311753010.	Ch. Akhila	Akhila
10.	2311753011.	K. Divya	K. Divya
11.	2311753013.	B. Suchasri	Sucha
12.	2311753014.	B. Sucha	B. Sucha.
13.	2311753015.	D. SaiPriya.	Sai priya
14.	2311753016.	T. Spandana	Spandana
15.	2311753017.	P. Akshitha	P. Akshitha
16.	2311753018.	K. karthik	K. karthik.
17.	2311753019	P. Mythri	P. Mythri
18.	2311753020	P. Shivisha	Shivisha
19.	2311753021	K. Saivarsha	K. Saivarsha.
20	2311753022	P. Sharath kumar	Sharath.
21.	2311753023	K. Srinu.	Srinu

HEAD
Department of Food Science & Quality Control
Vaagdevi Degree & PG College
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE
VDPGC
HANAMKONDA

Principal
Vaagdevi Degree & P.G. College
Kishanpura, Hanamkonda

ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

V – SEM

Class : BSc

Group : BZC

Subject : Chemistry

Topic : 1) Electronic Transition

Date : November 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213304	BANDARI NIKHITHA	
086213306	BASARKAR SANDEEP	
086213307	BEERLA AJAYKUMAR	
086213308	BHUKYA NEHRU	
086213311	BIRRU RAMYA	
086213312	BOCHHU MADHAVAN	
086213313	BODA RAVINDRA BHARATHI	
086213314	BOINI PRIYANKA	
086213316	BOLLA NAGARAJ	
086213318	BURRA BHAVANI	
086213319	BUSA GANESH	
086213323	DEVANABOINA RANJITH	
086213324	DONTHAGANI ARCHANA	
086213326	GADDA ANIL	
086213330	GOLI SAITEJA	
086213332	JARUPULA KEERTHANA	
086213334	KANUGULA CHANDANA	
086213336	KOTHAKONDA SWATHI	
086213339	LAKIDE PRATHIBHA	
086213340	LAVUDYA SANTHOSH	
086213344	MARAVENI ABHINAYA	
086213347	MOLLU SRAVANI	
086213351	MYDAM UDAYKIRAN	
086213353	NANGUNURI SRI VARSHA	
086213354	NARRA ABHISHEK	
086213358	PEDDAPELLY SUPRIYA	
086213360	PENDLI VIKAS	
086213361	PENTHALA KISHOR	
086213362	POKALA SANTHOSH	
086213364	PONUGOTI BHARATH	
086213367	RAISHETTI SUKANYA	
086213368	RAYARAKULA PRASHANTH	
086213369	ROUTHU MANISHA	
086213371	SARDAHANA PAVAN KALYAN	
086213376	THALLA RUSHIKESH	
086213377	THANGALLAPELLY POOJITHA	
086213378	THEEGALA SHIRISHA	
086213381	VALSA SAI NIVEDH	
086213384	VISAMPALLY EMEEMA	
086213388	BADAVATH GANESH	
086213391	MACHA AJAY	

HEAD
Department of Chemistry
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Electronic Transitions:-

The electrons in organic molecules may be involved, in bonding as strong σ-bonds weaks π-bonds can present in the Non-bonding from [lone pairs]. A variety of absorptions for electronic transistions within a molecule is thus possible, depending upon the Nature of bonding. Absorption of UV-visible radiation, therefore elevates these different types of electrons to excited antibonding orbitals.

Types of electronic transitions:-

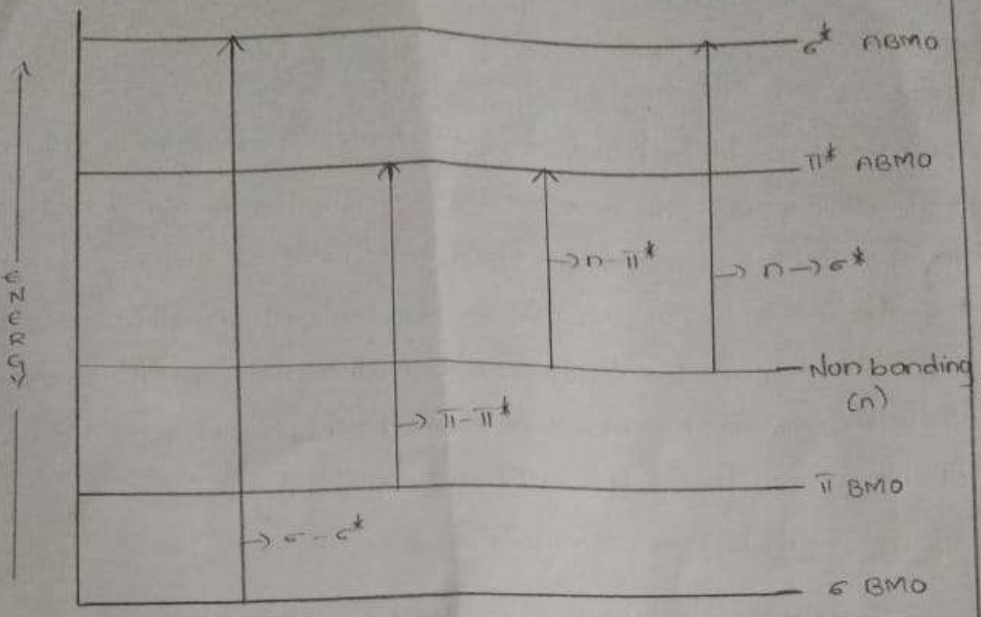
electronic transitions classified into two types i.e:-

1) Transitions between bonding and Antibonding orbitals.
2) Transitions between Non-bonding atomic orbitals and Antibonding orbitals.

1) Transitions between bonding and Antibonding orbitals:-

These are of two types i.e:-

i) $\sigma \longrightarrow \sigma^*$ ii) $\pi \longrightarrow \pi^*$

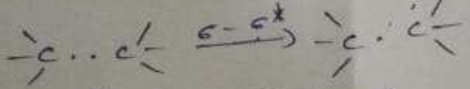


Electronic transitions

i) $\sigma \rightarrow \sigma^*$:-

In these transitions electrons, transfered, from 'σ' bonding Molecular orbitals to σ* Antibonding molecular orbitals. It's a high energy process because there is a large energy difference between σ and σ* Molecular orbitals, σ bonds are in General Very strong

ex:- uv visible



Alkane

$S = 0$

$S = (2S+1)$

$S = (2 \times 0 + 1)$

$S = 1$ singlet

$S = (2S+1)$

$S = (2 \times 1 + 1)$ $S = 1$

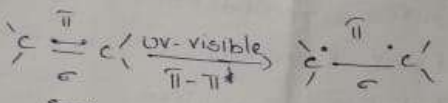
$S = 3$ triplet

In $\sigma \rightarrow \sigma^*$ electronic transition spin multiplicity of σ electrons undergoes inversion [singlet state to triplet state].

→ $\sigma \rightarrow \sigma^*$ electronic transitions takes place in saturated hydrocarbons.

ii) $\pi \rightarrow \pi^*$:-

In-those transitions electrons transferred from π-bonding, Molecular orbital to π^*- Anti-bonding molecular orbitals. This type of transitions occur in unsaturated centres of Molecules, i.e:- in compounds containing double or triple bonds, and also in Aromatics. The excitation of π- electrons requires smaller energy.

eg:- 

S = 0

S = (2S+1)

S = (2×0×1)

S = 1

singlet

S = (2S+1)

S = (2×1+1)

S = 3

triplet

2) Electronic transitions between Non bonding atomic orbitals and Antibonding Molecular orbitals:-

Orbitals:-

These are of two types ie:-

i) $n \rightarrow \pi^*$ ii) $n \rightarrow \sigma^*$.

i) $n \rightarrow \pi^*$:-

In these transitions electrons transferred from Non-bonding atomic orbitals to the antibonding π-molecular orbital (π^*). This transition requires least amount of energy at

-the transitions it's takes place in compounds containing double bonds involving hetero atoms bearing unshared pair of electrons.

ex: [C=O , C=S , -N=O]

ex: R-C(H)-O: —(UV-visible, n→π*)→ R-C(H)=O:

Aldehyde

ii) n→σ*:-

In these transitions electrons transferred from Non-bonding atomic orbitals to Antibonding σ-molecular orbital (σ*). It's takes place in saturated compounds containing one hetero atom with unshared pair of electrons. It's required less energy than σ→σ* electronic transition.

ex:-

-C(-)-X: —(UV-visible, n→σ*)→ -C(-)-X:

Alkyl halides

energy orders of electronic transitions:-

σ→σ* > n→σ* > π→π* > n→π*

Class : BSc

Group : BtBC

Subject : Chemistry

Topic : 1) Types of chromatography

Date : November 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213101	AKULA TEJASWINI	
086213102	CHETTI CHANDUPRIYA	
086213103	HAJRA KHATOON	
086213104	KANDIKONDA UDAYKUMAR	
086213107	MANUPATI MOSES	
086213108	MANUPATI SATHWIK TEJA	
086213109	MORE ANURAG	
086213110	MUNIGALA PRANAY	
086213111	MUNIGANTI VISHNU PRIYA	
086213113	PALLE RASHMITHA	
086213114	PERUMANDLA INDRAJA GOUD	
086213115	PITTALA ANNAMAIAH	
086213117	RAM SANDEEP	
086213118	SAI SRIYA TANJAVURI	
086213119	THUMMALA SRAVAN KUMAR	
086213120	VELPULA BHARATH	
086213121	ALUVALA SUCHARITHA	
245213002	CHALLA RAMA KRISHNA	

HOD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

** Classification of chromatography :-

=> chromatography is classified into mainly two types:-

1] Based upon phases

2] Based upon principles

1] Based upon phases :- Based upon phase that is stationary and mobile phase chromatography is classified into mainly ~~two~~ four types.

1] solid - liquid chromatography technique

2] solid - gas chromatography technique

3] Liquid - liquid chromatography technique

4] Liquid - gas chromatography technique

1] solid - liquid chromatography Technique :-

In this chromatography technique stationary phase is solid and mobile phase is liquid.

=> It is also called as absorption chromatography

Ex :- Thin layer chromatography, Ion exchange chromatography, column chromatograph.

2] solid - gas chromatography Technique :-

In this chromatography technique stationary phase is solid and mobile phase is gas.

=> It is also called as absorption chromatography.

Ex :- gas solid chromatography.

3] Liquid - liquid

In this chromatography technique both the stationary and mobile phase and liquid.

=> It is also called as partetion chromatography.

Ex:- paper chromatography

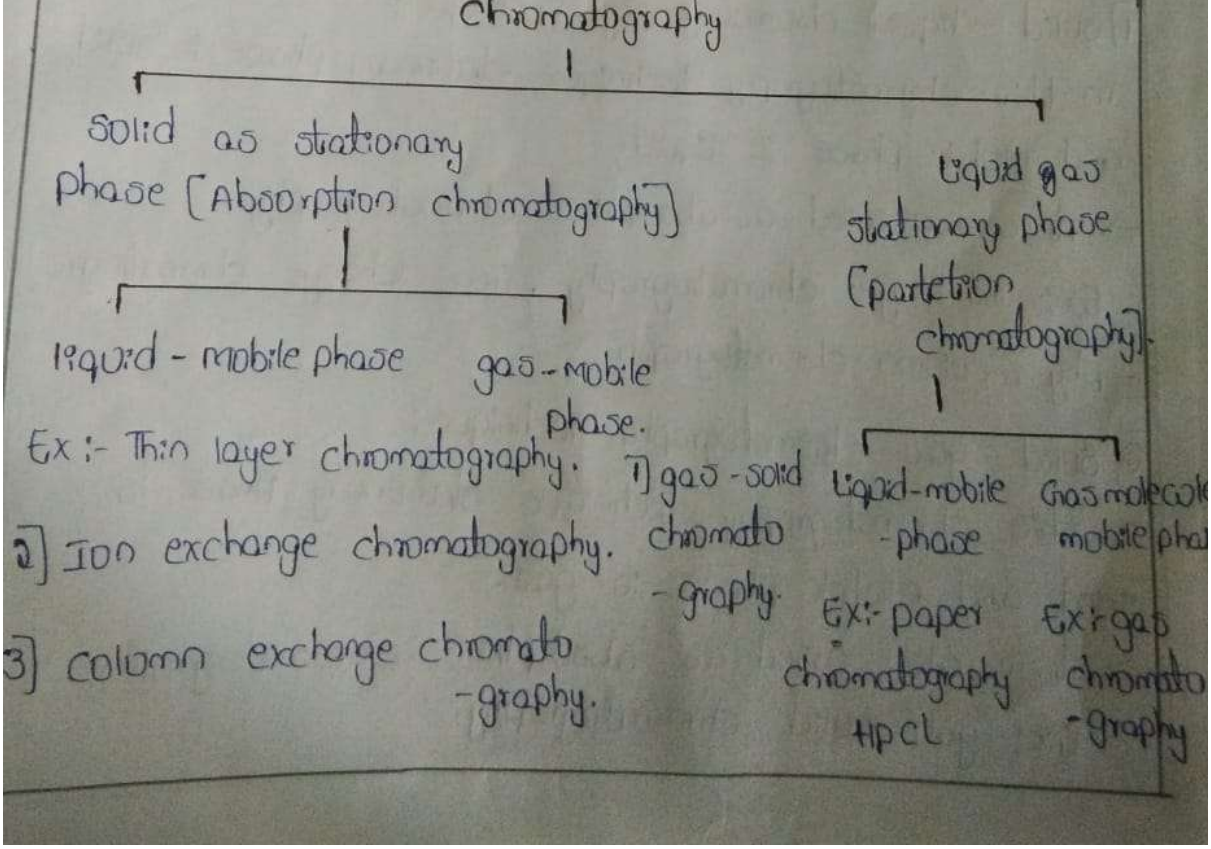
2] HPCL

4] Liquid - gas

In this chromatography technique stationary phase is liquid and mobile phase is gas.

=> It is also called as partetion chromatography

Ex:- Gas chromatography



Class : BSc

Group : BtZC

Subject : Chemistry

Topic : 1) Finger print region

Date : December 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213851	ADHRASANDI SRIKALA	
086213852	ALIKATTE KARTHIK	
086213853	ASALLA BINDHU	
086213854	BALABAKTHULA ANJALI	
086213855	BASHAVENI VIKRAM	
086213856	BHUKYA ASHOK	
086213857	CHATLA ARUN KUMAR	
086213858	DEVA SANDEEP	
086213859	DEVANDLA CHARISHMA	
086213860	GODISHALA SAI VARSHITH	
086213861	GUGULOTH VENKATESH	
086213862	GURRAM ARAVIND	
086213863	KANCHA BHAVYA SRI	
086213864	KANDIKONDA BHARATH CHANDRA	
086213865	KATUKURI RAJU	
086213866	KOLA NIKHILA	
086213867	MANDA RAJKUMAR	
086213868	MEDI AKSHITHA	
086213869	MOHAMMAD SHAMINA	
086213870	MONDEDLA KRISHNAVENI	
086213871	PALLE SANDEEP	
086213872	PODETY LAXMI PRASANNA	
086213873	PODILA ANJAIAH	
086213874	RACHAPALLY SHARANYA	
086213875	RAMAGONI MADHURI	
086213876	RAMANCHA ROHINI	
086213877	SANGI SUNNY	
086213878	SUNKE ANUSHA	
086213879	THOTA RAJKUMAR	
086213880	MUDAVATH SWATHI	

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

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HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda

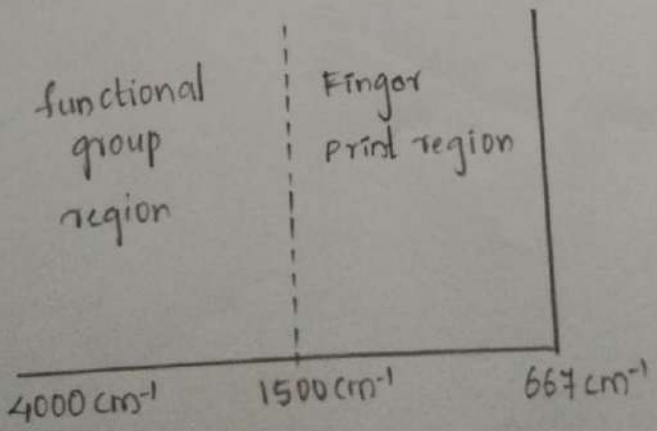
* Finger Print Region:

In electromagnetic radiation 667 cm^{-1} to 4000 cm^{-1} is called as IR region as. It is classified into two parts, i.e.,

i) Finger print region (667 - 1500 cm^{-1})

ii) Functional group region (1500 - 4000 cm^{-1}).

With the help of finger print region we can determine the identity of organic compounds because in functional group region when the compounds are having same functional group and different structure also gave to same spectrum. So it's not differentiated from each other. But its spectra recorded by using fingerprint region IR radiation then it gives different types of spectra although it containing same functional groups. So it is differentiated from each other with the help of IR spectra of compounds.



Class : BSc

Group : BtMiC

Subject : Chemistry

Topic : 1) Chromophore and Auxochrome

Date : December 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213001	ARREM PRATHYUSHA	
086213002	BURA SATHVIKA	
086213003	CHENNABOINA SHRAVYA	
086213004	CHERRIPELLY ANJALI	
086213005	EEKA POOJA	
086213006	GADDAM RAVALI	
086213007	JAMPALA VISHAL	
086213008	KAPIL EEKA	
086213009	KEERTHI UJWALA	
086213010	KONDA KEERTHANA	
086213011	KOYATI NANDINI	
086213012	KOYYALA PRANAY	
086213013	MADURI ROHITH KUMAR	
086213014	MANKALA SHANTH KUMAR	
086213015	MEKALA ROHITH	
086213016	MOHAMMED RABIYA	
086213017	MOTHUKURI PREETHI	
086213018	MUDDAMALA SWARANI	
086213019	MUNUKUNTLA AMULYA	
086213020	NANNUTA HARSHITHA	
086213021	PIDATALA MOUNIKA	
086213022	RACHA LOHITHA	
086213023	SANA TABASSUM	
086213024	SINGU BHAVYA SRI	
086213025	VANGALA VIKRAM	
086213026	VENNA SRIRAM	
086213027	YERRAM SRI KAVYA	

Dr. ...AD
... Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
...amkonda

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Due do presence of chromophores compou absorbed the light from visible region and its appeared as the coloured compounds to the human eye.

There are two types of chromophores

a) chromophores in which the group contains π- elements and they undergo $\pi \rightarrow \pi^*$ transition.

b) chromophores which contains both π- electrons and non- bonding electron (n) undergo. two types of transition $\pi \rightarrow \pi^*$ and $n \rightarrow \pi^*$.

2) Auxochromes:-

An auxochrome can be defined as any group which doesnot itself act as a chromophore but whose presence brings about a shift of the absorption band towards the longer wave length.

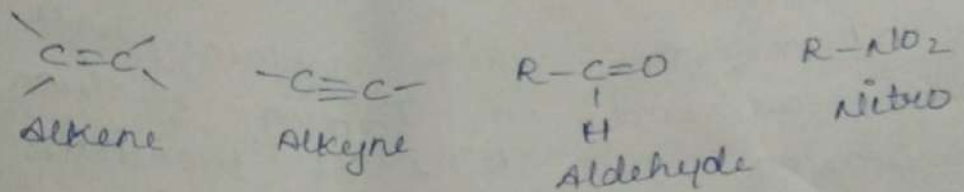
Ex:- $-\ddot{O}H$ (Hydroxy) $-\ddot{O}-R$ (Ether)

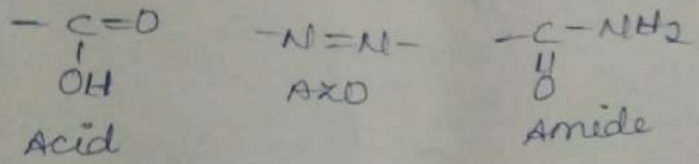
$-\ddot{N}H_2$ (Amine) $-\ddot{N}H-R$ (2° amine)

Chromophore :-

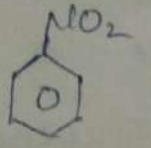
A chromophore is defined as any system which is responsible for imparting color to the compound

Ex:-

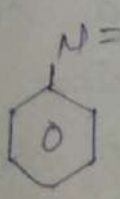




Nitro compounds are generally yellow in color due to the presence of $-NO_2$ group



Nitro benzene
chromophore-
(Nitro group)

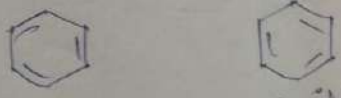


Benzene diazonium chloride
chromophore - AZO group.

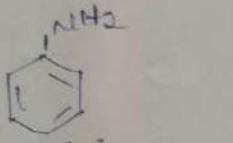
The Effect of the auxochromes is due to its ability to extend the conjugation of a chromophore by the sharing of non-bonding electrons Thus, a new chromophore results which has a different value of the absorption maximum as well as the Extinction coefficient

Ex:-

Benzene shows an absorption maximum at 255 nm where as Aniline absorbs at 280nm. Hence amino groups is an Auxochrome.



Benzene
Colourless



Aniline
Light yellow

$-\ddot{N}H_2$.
Auxochrome.

ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

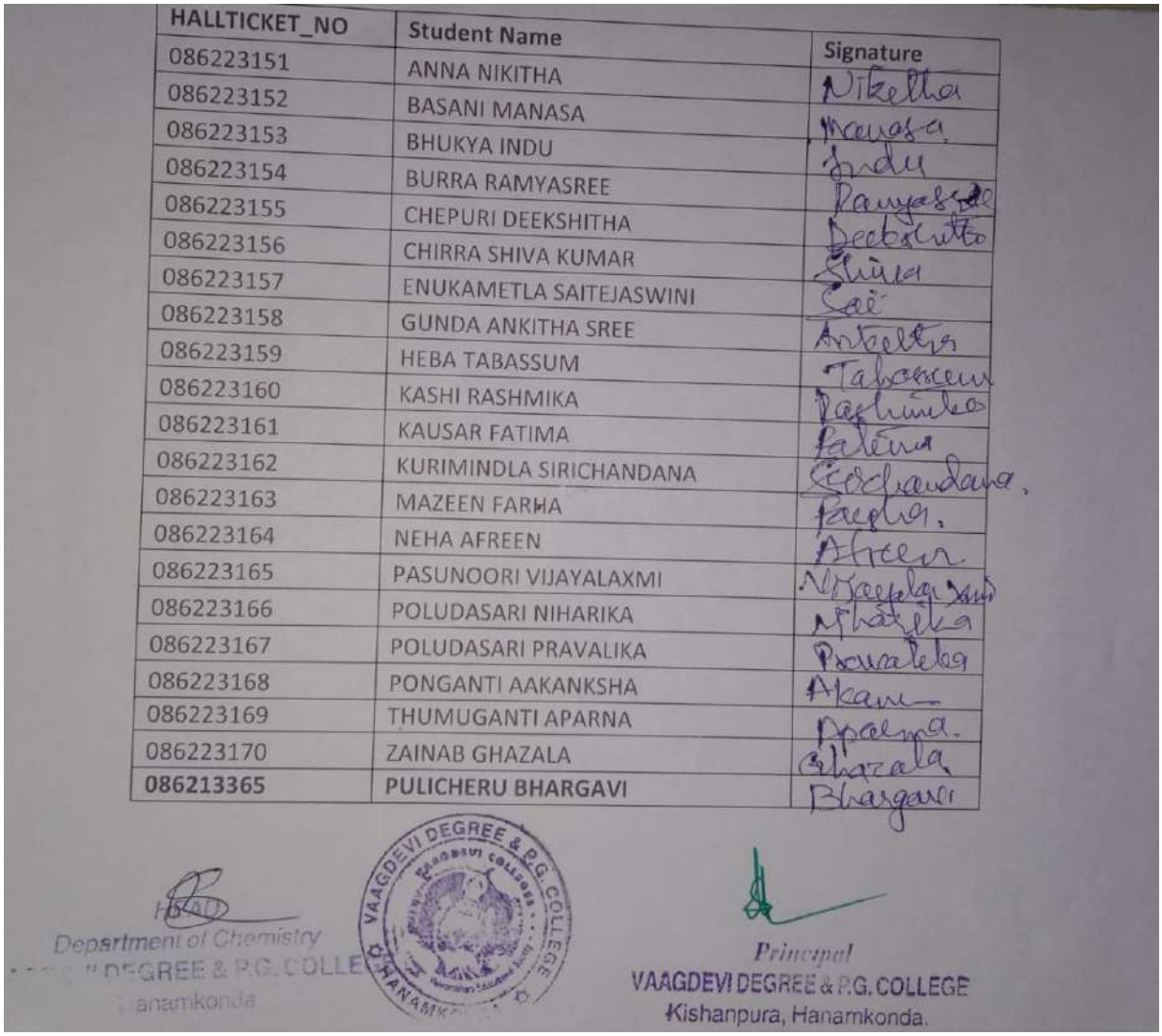
III – SEM

Class : BSc

Group : NDZC

Subject : Chemistry

Topic : 1) Similarities between Lanthanides and actinides



HALLTICKET_NO	Student Name	Signature
086223151	ANNA NIKITHA	
086223152	BASANI MANASA	
086223153	BHUKYA INDU	
086223154	BURRA RAMYASREE	
086223155	CHEPURI DEEKSHITHA	
086223156	CHIRRA SHIVA KUMAR	
086223157	ENUKAMETLA SAITEJASWINI	
086223158	GUNDA ANKITHA SREE	
086223159	HEBA TABASSUM	
086223160	KASHI RASHMIKA	
086223161	KAUSAR FATIMA	
086223162	KURIMINDLA SIRICHANDANA	
086223163	MAZEEN FARHA	
086223164	NEHA AFREEN	
086223165	PASUNOORI VIJAYALAXMI	
086223166	POLUDASARI NIHARIKA	
086223167	POLUDASARI PRAVALIKA	
086223168	PONGANTI AAKANKSHA	
086223169	THUMUGANTI APARNA	
086223170	ZAINAB GHAZALA	
086213365	PULICHERU BHARGAVI	

Department of Chemistry
DEGREE & P.G. COLLEGE
anamkonda

VAAGDEVI DEGREE & P.G. COLLEGE

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Date : November 2022 – 2

Similarities between Lanthanides & Actinides:-

-> Both series show +3 oxidation state.
-> In both the series f- orbitals are being progressively filled.
-> Both show the decrease of atomic size & with increase atomic number [Lanthanide contraction] & [Actinide contraction].
-> Due to f-f-transition the absorption spectra of the elements of both the series / elements give sharp line like band spectra the.
-> The electronegativity value of elements of both the series are low & these elements are quite reactive.
-> The nitrate, perchlorate & sulphates of the valence elements of both series are soluble.
-> The carbonates & hydroxides of the valence elements of both series are soluble.
-> The carbonates & hydroxides of trivalent of both the series are insoluble.
-> Members of both the series show ion exchange behaviour.

Lanthanides	Actinides
-> The chemistry of all members of this series is very similar due to large energy difference in 4f and 5d sub level.	-> Considerable variants is observed in the these elements. This is due to very small energy difference 5f & 6d sub level.
-> They have high binding energy.	-> These binding energy is low.
-> These elements exhibits a maximum oxidation state of +4	-> Due to lower binding energies these elements show higher oxidation states are well such as +4, +5, +6, +7 oxidation state.
-> The paramagnetic properties shown by the elements can be easily explained.	-> The paramagnetic properties of the elements are different to explain.
-> These complex formation tendency is not very high. These complexes with π bonding ligand are not known.	-> They show a very high tendency to form complexities they form complexes with π-bonding ligand such as thio-ethers.
-> Except Pm, the elements of the series are non radio active.	-> The elements of this series are radio active.

Class : BSc

Group : BtBC

Subject : Chemistry

Topic : 1) Heat capacity of a system

Date : November 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213112	NALLA SAHAJA	Sahaja
086223101	APPE NAGA HIMADWITHA	Himadwitha
086223102	BANDI VIJAYALAKSHMI	Vijaya La Kshmi
086223103	CHITYALA PRATHYUSHA	Prathyusha.
086223104	DHAKUR SOORAJ	Sooraj
086223105	DOGGALA RANJITH OFIR	Ranjith
086223106	DONTHURI SHASHANK	Shashank
086223107	GAJJELA ARAVIND	Aravind
086223108	GUDIKANDULA NAGARAJU	Nagaraju
086223109	JANAGANI PRASANNA	Prasanna.
086223110	KANNOJU SHIREESHA	Shireesha.
086223111	KANNOJU VIVEKANANDA	Vivekananda.
086223112	KATKURI AKASH REDDY	Akash.
086223113	LAKKARSU SRAVANI	Sravani.
086223114	MEKALA SATHWIKA	Sathwika
086223115	NAGANABOINA SRIVARSHA	Srivarsha.
086223116	PARUPATI ABHIRAM REDDY	Abhiram Reddy.
086223117	PENTA POOJITHA	Poojitha
086223118	VAVILLA CHANDANA	Chandana.

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Heat Capacity of a system (or) a gas

Heat capacity of a system is defined as the amount of heat observed by it. In raising it is temperature by 1°.

If Q calories is the heat absorbed by a system and the temperature rises from T_1 K to T_2 K then heat capacity (c) of the system or gas is given by the expression.

$$C = \frac{Q}{T_2 - T_1}$$

$$C = \frac{Q}{\Delta T} \quad -(1)$$

Heat capacity for 1 gram of a substance are known as specific heat while heat capacities for 1 mole of gas are known as molar heat capacity and disignated with 'c'.

If Q is the small amount of heat absorbed by a system and temperature of the system increases by a small amount than the heat capacity of the system is given.

$$C = \frac{\partial Q}{} \qquad c = \frac{\partial Q}{\partial T} \quad -(2)$$

Thus, heat capacity may be defined as the ratio of the amount of heat absorbed to the rise in temperature.

Units: cal deg^{-1} mol^{-1}

cal k^{-1} mol^{-1}

Q is not a state function and depends upon the path.

∴ Heat capacity is also not a state function.

Hence it is considered as path function.

ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

I – SEM

Class : BSc

Group : BtMiC

Subject : Chemistry

Topic : 1) Hybridization

Date : November 2022 – 2023

HT NO	Student Name	Signature
086233001	ADEPU DEEPTHI	Deepthi
086233002	AKULA KALYANI	Kalyani
086233003	ALLABOINA GREESHMIKA	Greeshma
086233004	ANABHATHULA UMESH	Umesh
086233005	ARUKALA RAHUL	Rahul
086233006	BANOTH SWAPNA	Swapna
086233007	BOMMATHI LASYAVARDHINI	Lasya.
086233008	BUKYA SWATHI	Swathi
086233009	KARANGULA SUCHITHA	Suchitha
086233010	KUNAL BHADRA	Bhadra.
086233011	KUNDARAPU HARINI	Harini
086233012	MANDA MOKSHAGNA	Mokshagna
086233013	MANDA RAVEENA	Raveena
086233014	MANTHENA ROHITHA	Rohitha
086233015	MEDIPELLY SOUMYA	Soumya
086233016	MEENA RINKU	Rinku
086233017	MEKALA VINITHA	Vinitha
086233018	SETTY SATHWIKA	Sathwika
086233019	SHANIGARAM SAI VAMSHI	Sai vamshi
086233020	THOKALA ASHWINI	Ashwini
086233021	NERA AISHWARYA	Aishu

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

- Hybridisation

• Intermixing of atomic orbitals nearly same energy to form hybrid orbitals of equal energy and identical shape

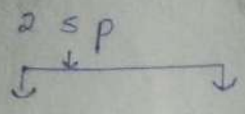
• it is proposed by pauling to explain shapes and bond angles of molecules which can it be explained by VBT

Types:-

1) sp
2) sp^2
3) sp^3
4) sp^3d
5) sp^3d^2
6) sp^3d^2

- Sp hybridisation :-

• One s orbital & one p orbital ⇒ 2sp hybrid orbitals

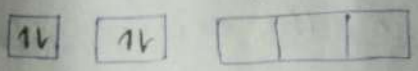


Bond angle = 180°

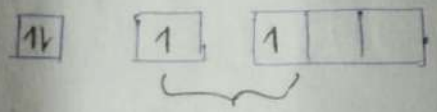
shape = Linear shape

Ex: $BeCl_2$ (Beryllium chloride)

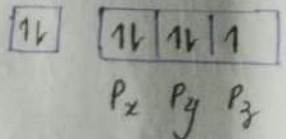
Ground state of Be = $1s^2\ 2s^2\ 2p^0$

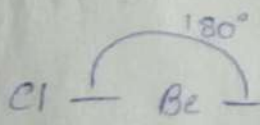


Excited state of Be = $1s^2\ 2s^2\ 2p^1$



Cl = 17 = $[Ne]\ 3s^2\ 3p^5$





⇒ 2 σ bonds.

Defination :-

One 's' orbital & one 'p' orbital of nearly same energy intermixing to form two sp hybrid orbitals is called sp hybridisation.

- The bond angle between with these is 180° and each sp hybrid orbital has 50% 's' character and 50% of 'p' character. The valency of Beryllium should be zero but it exhibits valency "two" in its compounds.

- To explain this Beryllium atom is considered to be present in the excited state, when one of the 2s electron enter into the $2p_x$ orbital.

- This is explained by sp hybridisation of Beryllium.

- The two orbitals are linear shape and at an angle 180°

- These sp hybrid orbitals of Beryllium overlap two 2ps, two $2p_y$ orbitals of chlorine to give two σ bonds in beryllium chloride orbitals ($BeCl_2$)

- Sp^2 hybridisation

Ex: BCl_3 (Boron trichloride)

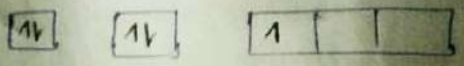
Ground state B = $1s^2\ 2s^2\ 2p^1$

Excited state B = $1s^2\ 2s^1\ 2p^2$

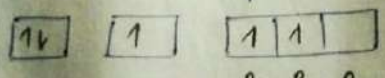
- One s orbital and two p orbitals of nearly same energy, intermixes to form $3sp^2$ hybrid orbitals is called sp^2 hybridisation
- The bond angle between these is 120° & each sp hybrid orbital has 33.3% "s" character and 66.6% "p" character

ex: BCl_3 (Boron trichloride)

Ground state of B = $1s^2\ 2s^2\ 2p^1$

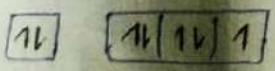


Excited state of B = $1s^2\ 2s^1\ 2p^2$

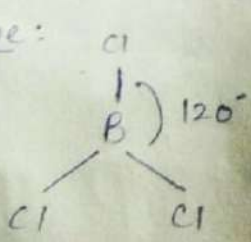


sp^2 hybridisation

Cl = 17 = [Ne] $3s^2\ 3p^5$



Shape:



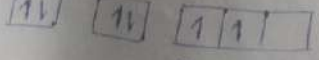
⇒ "3σ bonds"

Sp^3 hybridisation:

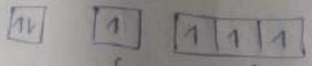
One s orbital and three p orbitals of nearly same energy, intumixes to form 4 sp^3 hybrid orbitals in sp^3 hybridisation.

Ex: CH_4 - Methane

Ground state of C = $1s^2\ 2s^2\ 2p^2$



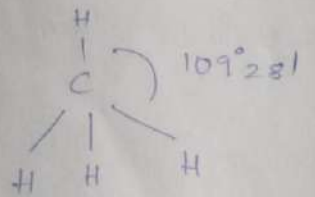
Excited state of C = $1s^2\ 2s^1\ 2p^3$



sp^3 hybridisation

- H = $1s^1$ [H = hydrogen]

Shape:



- 4 σ bonds
- Bond angle 109°28'
- Tetrahedral shape
- In sp^3 hybridisation the 's' character has 25% & 'p' character has 75%

Class : BSc

Group : BtZC

Subject : Chemistry

Topic : 1) Hunsdiecker reaction

2) Postulates of VESPER theory

Date : November 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086233171	ADEPU SWATHI	
086233172	BOLLE DHANUSRI	
086233173	CHENNA RAGHU	
086233174	CHINTHIREDDY ANIL REDDY	
086233175	DASARI REVATHI	
086233176	GOLLA ANIL	
086233177	GONELA RAHUL	
086233178	GOPAGANI DILIP	
086233179	JANGA SAI KRISHNA	
086233180	JAVAJI SANKEERTHANA	
086233181	KADASU SRAVANI	
086233182	KAMIDRI RAVITEJA	
086233183	MAHAMMAD ROSHINI BEGAM	
086233184	PATHURI SIJJU	
086233185	SHAKAPURAM SAI RAM	
086233186	SRIPATHI BHARATH	
086233187	THALLA PRABHAS	
086233188	THALLA RITHVIK	
086233189	AISHA SULTANA	

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

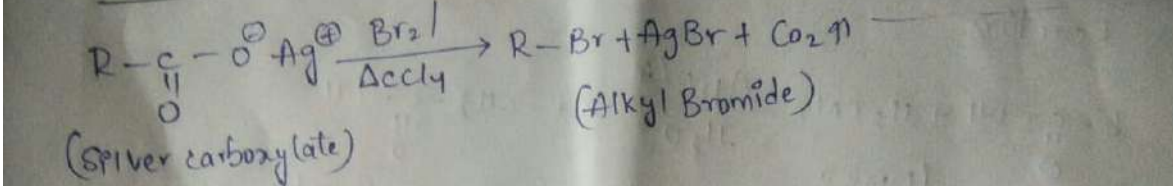
VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Hunsdiecker Reaction

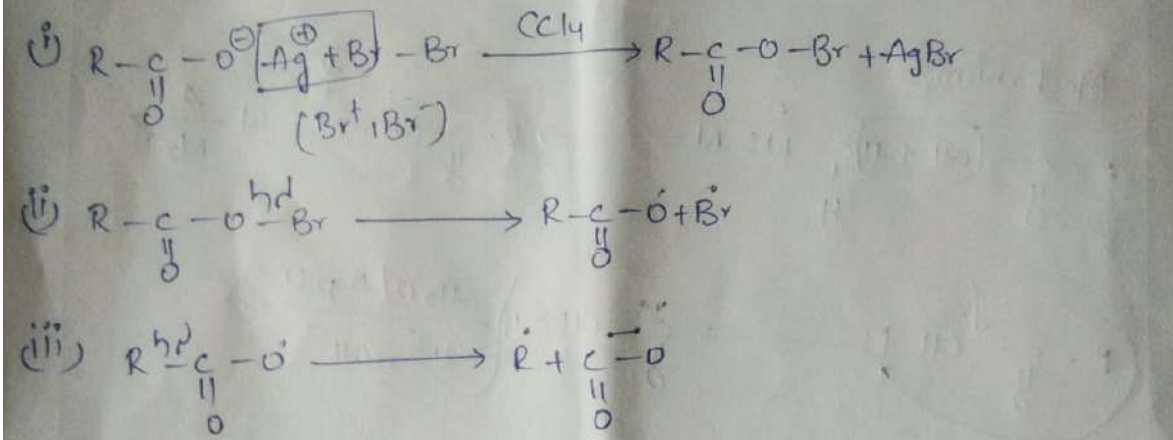
Silver Carboxylates are Reacted with Bromine in presence of CCl_4 solvent to Form Alkyl Bromides

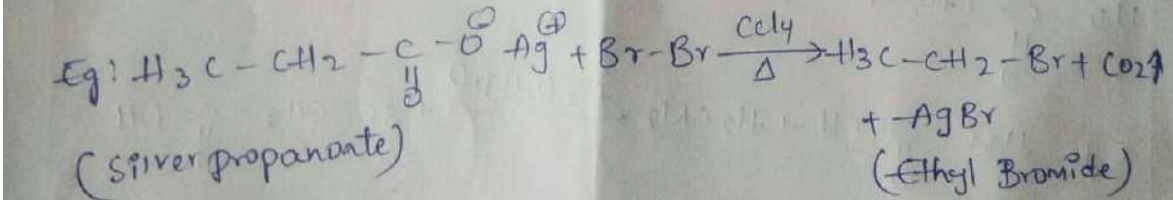
Reaction



(Silver carboxylate) (Alkyl Bromide)

Mechanism:





(Silver propanoate) (Ethyl Bromide)

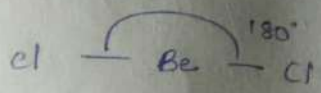
molecule Sidgwick & Paul proposed this theory.

- Postulates of VSEPR Theory:

- The shape of a molecule depends upon number of valency shell electron pair around the central atom.

Ex: $BeCl_2$ - Beryllium chloride

C: Be:



- Number of bond pair electron and number of lone pair electron are depends on the central atom
- Electron pair arranged around the central atom in such a ways in which replusion between them is minimum.
- Eledron pair in which ~~bonding~~ inbonding are called bond pairs which are not involved in bonding are called lone pairs.

Replusion order:

Lone pair - Lone pair > lone pair - Bond pair > Bond pair - Bond pair

- Lone pair occupies more space than bond pair (lone pair attracted by single atom and bond pair attracted by two atoms)

Class : BSc

Group : BtZC

Subject : Chemistry

Topic : 1) Types of Silicones

2) Applications of silicones

Date : November 2022 – 2023

H.T.No	Student Name	Signature
086233301	AKIREDDY SRILEKHA	
086233302	BALLA RAGHU	
086233303	BASHABOINA POOJITHA	
086233304	DEEGUNTLA GANESH	
086233305	DENKANI NITHIN	
086233306	DONGRE SREEJA	
086233307	GADDAM KAVYA	
086233308	GANGADHARI AKSHAYA	
086233309	KOUTAM SUCHITHRA	
086233310	KUDURUPAKA RAMYA	
086233311	MALLELA MEGHAMALA	
086233312	MAMIDI NITHIN	
086233313	MOTHUKURI SADHIKA	
086233314	MUNIGADAPA NANDINI	
086233315	MUNIGALA DEEPIKA	
086233316	NEERATI BUNNY	
086233317	POLU AKHILA	
086233318	PRATHAPANENI NAVYA	
086233319	PURUSHOTHAM SUVARTHA	
086233320	RAJABOINA AKHILA	
086233321	RODDA ABHINAYA	
086233322	SATHU RAMYA SRI	
086233323	SIDDABOINA SHYAM SUNDER	
086233324	THOTA ANJALI	
086233325	UPPULA SRUTHI	
086233326	VANGA SANDEEP	
086233327	VOLLALA SUSHMA	
086233328	BANOTH HEMANTH	
086233329	BHUKYA RAKESH	
086233330	POTHA NIKITHA	

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

SILICONES

- Silicones are polymers of organometallic compound containing a network of alternating silicone and oxygen atom.
- They are polymeric compounds having Si-O-Si linkage

PREPARATION

1. By use of Grignard reagent

- $SiCl_4$ [silane] react with Grignard reagent and form 3 types of Silanes
- Mono Methyl Trichloro silane
- Di Methyl Dichloro silane
- Tri Methyl Monochloro silane

1) $SiCl_4 + H_3C\ MgCl \longrightarrow CH_3SiCl_3 + MgCl_2$
(Mono Methyl Trichloro Silanes)

2) $H_3CSiCl_3 + H_3C\ MgCl \rightarrow (H_3C)_2SiCl_2 + MgCl_2$
(DiMethyl Dichloro silane)

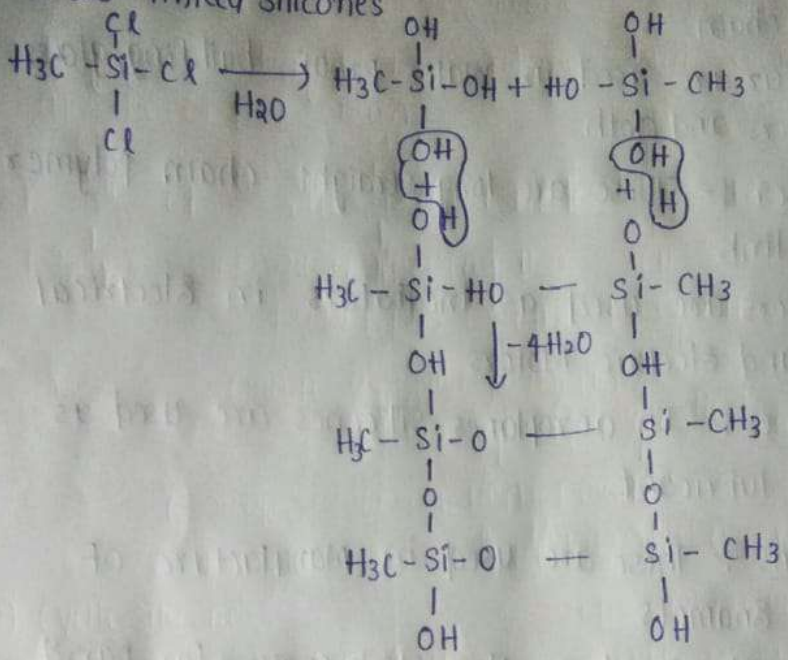
3) $(H_3C)_2SiCl_2 + H_3C\ MgCl \rightarrow (H_3C)_3SiCl + MgCl_2$
(TriMethyl Mono Chloro Silane)

Silicones are classified into 3 types

1) Linear Silicones
2) Cyclic silicones
3) Cross linked Silicones

Cross linked Silicones

When alkyl Trichloro silane undergoes hydrolysis, the obtained product undergoes condensation and form cross linked silicones



Properties of silicones

- Silicones are thermally stable and better than organic compounds
- They are having hardness & inertness in them
- The Elastic nature of silicone rubber is greater than that of Natural Rubber
- Silicones can with stand high temparature and sunlight

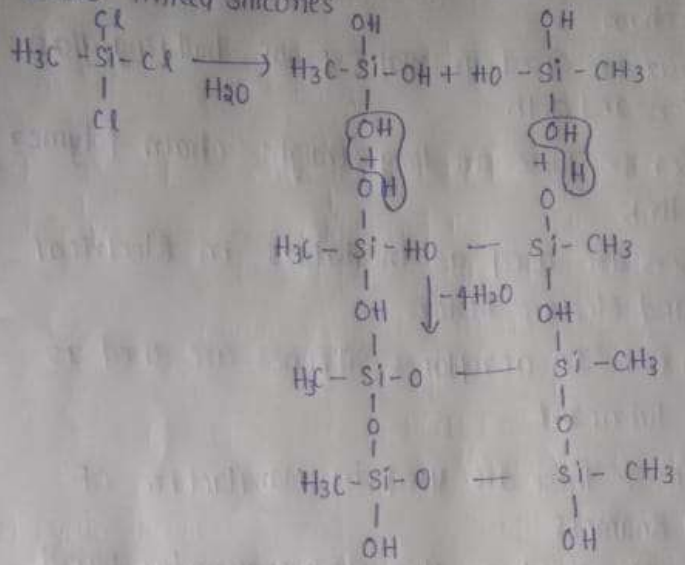
Applications of Silicones

4 types of applications are there

1. Silicone fluids
2. Silicone Rubber
3. Silicone greases
4. Silicone resins

Cross linked Silicones

When alkyl Trichloro silane undergoes hydrolysis, the Obtained product undergoes condensation and form Cross linked silicones



Properties of silicones

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- They are having hardness & inertness in them
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- Silicones can with stand high temparature and sunlight

Applications of Silicones

4 types of applications are there

1. Silicone fluids
2. Silicone Rubber
3. Silicone greases
4. Silicone resins

1. Silicone fluids :- Simple straight chain Silicones containing 20-500 units are used to prepare Silicone fluids.
   - They are used as water repellants as they contain organic side chain
   - Silicone vapour are used in water proof building, glass material, papers and cloth
2. Silicone Rubber :- These are long straight chain polymers with cross link
   - Silicone Rubbers are used as incubators in Electrical instruments and Electric Motors
3. Silicone greases :- In aeroplanes Silicones are used as greases or lubricant
4. Silicone resins :- These are used in manufacture of paints and Enamels
   - Silicones are also used as Non-stick coating for pans & Moulds for car tyres.

Class : M.Sc

Subject : Chemistry

Group : Organic chemistry

Topic : 1) Explain about electron transfer reaction of

i) inner sphere mechanism.

ii) outer sphere mechanism.

Date : November 2022 – 2023

Vaagdevi Degree & P.G College

Kishanpura,Hanamkonda

M.Sc III SEM (CHEMISTRY) NOMINAL ROLLS - 2022

H.T.NO.	NAME	SIGNATURE
22117-S-0601	KATUKURI SRAVANI	Sravani
22117-S-0602	MOTE DIVYA	Divya
22117-S-0603	CHUNCHU NAVYA	Navya.
22117-S-0604	MOGILICHERLA SNEHA	Sneha
22117-S-0605	PRATHYUSHA RAVULA	Prathyusha
22117-S-0606	THOTA RAMYA	Ramya
22117-S-0607	MERUGAVENI SATHISH	Sathish.
22117-S-0608	BOKKA SPANDANA	Spandana
22117-S-0609	VEERAGONI SRITHASRI	Srithasri
22117-S-0610	GORLA MOUNIKA	Mounika
22117-S-0611	GODISHALA AKHILA	Akhila
22117-S-0612	RAKAM SINDHUJA	Sindhuja
22117-S-0613	DAMERA SRAVANTHI	Sravanthi
22117-S-0614	SOLLETI MOUNIKA	Mounika
22117-S-0615	JELLA SHRUTHI	Shruthi
22117-S-0616	GOSULA ARUN KUMAR	Arun kumar.
22117-S-0617	AKULA KALYANI	Kalyani
22117-S-0618	KUVARAPU ROHITH	Rohith
22117-S-0619	LAKAVATH SAIDU	Saidu
22117-S-0620	JATOTH MANJULA	Manjula
22117-S-0621	MOTTE ANJALI	Anjali
22117-S-0622	MANCHALA BIKSHAPATHI	Bikshapathi.
22117-S-0623	DEVANAPALLY PAVAN	Pavan
22117-S-0624	KAMPELLA NAVEEN	Naveen.
22117-S-0625	KANDULA RANJITH	Ranjith
22117-S-0626	TIPLE SRIKANTH	Srikanth
22117-S-0627	GOGULA MOUNIKA	Mounika
22117-S-0628	BANOTHU CHANDANA TEJA	Chandana Teja
22117-S-0629	PERVARAM VAAGDEVI	Vaagdevi
22117-S-0630	VELPULA.SWETHA	Swetha.
22117-S-0631	GAJJALAKONDA DINESH	Dinesh
22117-S-0632	D.PRAVALIKA	Pravalika
22117-S-0633	MD.NAZIYAFARHEEN	Naziyafarheen
22117-S-0634	BOORA ARCHANA	Archana
22117-S-0635	NAGOTU PREMSAI	Premsai
22117-S-0636	M.DILEEP	Dileep.

Prin

VAAGDEVI DEGR

Electron Transfer Reactions of Complexes (Redox Reactions):-

→ These are the reactions in which the transfer of an Electron from one atom to other occurs and hence oxidation States of same atoms changes based on mechanism.

⇒ These reactions mainly classified into 2 types

1) Inner sphere mechanism / Atom (or) Group transfer mechanism (or) Bridge activated complex mechanism.
2) Outer Sphere mechanism / Direct $e^{\ominus}$ transfer / Tunneling mechanism

1) Inner Sphere Mechanism :- These are the reactions in which $e^{\ominus}$ transfer takes place through a bridged group common to complex to the shells of both the metal ions.

$$[Co^{III}(NH_3)_5X]^{+2} + [Cr^{II}(H_2O)_6]^{+2} + 5H_3O \longrightarrow [Co^{II}(H_2O)_6]^{+2}$$

Oxidant
$Co^{+3} \rightarrow 3d^6$
low spin & inert

Reductant
$Cr^{+2} \rightarrow d^4$
High Spin & labile

Reduced product
$Co^{+2} \rightarrow d^7$
High Spin & labile

+

$$5NH_4 + [Cr(H_2O)_5X]^{+2}$$

oxidised Product
$Cr^{+3} \rightarrow d^2$
low spin & inert

$X = F^-, Cl^-, Br^-, I^-, SO_4^-, NCS^-, N_3^-, PO_4^{-3}, P_2O^{-4}, CH_3COO^-$ etc.

Mechanism :-

$$[(H_3N)_5Co^{III}-X]^{+2} + [(H_2O)Cr^{II}(H_2O)_5]^{+2} \xrightarrow{-H_2O} [(H_3N)_5Co^{III}-X-Cr^{III}(H_2O)_5]^{+4}$$

$e^{\ominus}$ transfer

$$[(NH_3)_5Co(H_2O)] \xleftarrow{+H_2O} [(H_3N)_5Co^{III}-X-Cr^{II}(H_2O)_5]^{+4}$$

Bridged activated complex

$$\downarrow +5H_2O \quad + \quad [Co^{II}(H_2O)_6]^{+2} \quad [Cr^{III}(H_2O)_3X]^{+2}$$

Reduced Product oxidised product

⇒ In the inner sphere mechanism proceeds through formation of bridged intermediate followed by dissociation and $e^{\ominus}$ Transfer.

* Step (1) :- The Hexa aquo chromium (II) $[Cr^{II}(H_2O)_6]^{+2}$ loses a water molecule and forms a bridged activated complex. intermediate with $[Co(NH_3)_5X]^{+2}$.

* Step (2) :- In the activated bridged complex the $e^{\ominus}$ transfer takes place from Cr^{+2} ion to Co^{+3} through the bridge i.e $X^{\ominus}$. then the intermediate dissociates to give 6-co-ordinated $[Cr(H_2O)_5X]$ complex and 5-co-ordinated $[Co(NH_3)_5]$ complex.

* Step (3) :- The 5-Co-ordinated Co^{+2} complex reacts with H_2O molecule from the medium and forms. 6-co-ordinated penta amine aquo Cobalt (II) complex i.e, $[(H_3N)_5Co(H_2O)]^{+2}$ complex

* Step (4) :- The 6-Co-ordinated Co(II) complex. i.e, $[(H_3N)_5Co^{II}(H_2O)]$ is unstable. hence, it undergoes complete aquation to give

Hydrated Cobalt (II) Complex i.e, $[Co(H_2O)_6]^{+2}$.

→ In this mechanism, the electron is shifting from one metal (Cr^{+2}) to another metal (Cr^{+3}) with in the co-ordination sphere. Hence, it is called inner sphere mechanism. and also the atom (x) is transferred from one metal complex $[Co(NH_3)_5X]^{+2}$ to another $[Cr(H_2O)_6]^{+2}$. Hence it is called group (or) Atom transfer mechanism.

→ The $e^{\ominus}$ transfer is taking place only to the formation of the Bridge activated complex. So, this mechanism is also called as "Bridged activated complex mechanism".

⇒ The rate of $e^{\ominus}$ transfer changes when there is change in the Halogen i.e, $SO_4^{-2} > Cl^- > F^-$

Fast Slow

$F^- < Cl^- < Br^- < I^- < SO_4^{-2}$

Slow Fast

* Generalised Mechanism :-

Step(1) :- formation of precursor bridged activated complex :

$$Ox - x + Red - H_2O \xrightarrow[-H_2O]{} Ox - x - Red$$

Step(2) :- Electron Transfer associated with Rearrangement.

$$Ox - \overset{\downarrow e^-}{x} - Red \longrightarrow Ox^{\ominus} - x - Red^{\oplus}$$

Step(3) :- Dissociation of Bridged activated complex.

$$Ox^{\ominus} - x - Red^{\oplus} + H_2O \longrightarrow Ox - H_2O + Red - x$$

Rate $\propto$ [Reductant] [Oxidant]

∴ It is 2nd order.

2) Outer Sphere Mechanism

→ These are the reactions in which the co-ordination sphere of ions undergoing redox reaction is not altered.

⇒ These reactions occurs by direct $e^{\ominus}$ transfer.

* Generalised Mechanism:

Step (1): formation of Precursor complex:

$$Ox + Red \rightleftharpoons Ox \,||\, Red \text{ (Precursor Complex)}.$$

Step (2): $e^{\ominus}$ transfer by rearrangement to give Successor Complex:

$$Ox \,||\, Red \longrightarrow \overset{\ominus}{Ox} \,||\, \overset{\oplus}{Red} \text{ (Successor Complex)}.$$

Step (3): Dissociation of Successor complex to form Products:

$$\overset{\ominus}{Ox} \,||\, \overset{\oplus}{Red} \rightleftharpoons \overset{\ominus}{Ox} + \overset{\oplus}{Red}$$

Ex:- $[{}^{*}Fe^{II}(CN_6)]^{-4} + [Fe^{III}(CN)_6]^{-3} \longrightarrow [{}^{*}Fe^{III}(CN)_6]^{-3} + [Fe^{II}(CN)_6]^{-4}$

Reductant — oxidant — ferricyanide — ferrocyanide

$e^{\ominus}$

ferrocyanide: low spin & inert

ferricyanide: low spin & inert

${}^{*}Fe^{II}-CN$ + $Fe^{III}-CN$ → ${}^{*}Fe^{II}-CN$ + $Fe^{III}-CN$

long bond — short bond — short bond — long bond.

$$[Ox] + [Red] \longrightarrow [\overset{\ominus}{Ox}]\,[\overset{\oplus}{Red}] \longrightarrow [\overset{\ominus}{Ox}]\,[\overset{\oplus}{Red}] \longrightarrow [Ox]^{\ominus} + [Red]^{\oplus}$$

→ In this mechanism, $e^{\ominus}$ is jumping from one co-ordination sphere to another Co-ordination sphere. Hence, it is called as "Outer-Sphere mechanism".

ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

VI – SEM

Class : BSc

Group : FsZC

Subject : Chemistry

Topic : 1) Explain about diseases

2) Explain about drug terminology

Date : February 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213401	ADIBA SAMREEN	A. Samreen
086213402	ERROJU SRAVYA SRI	E. Sravya Sri
086213403	GUDEPU BINDUSRI	Bindu
086213404	HABEEBUNNISSA BEGUM	H.B. Begum
086213405	JALLIGAMPALA SATHYANARAYANA	Satyanarayana
086213406	KOYYADA SHIVANI	Shivani
086213407	KURLA SOUMYA	Soumya
086213408	MACHARLA SARITHA	Saritha
086213409	MOHAMMED RAHIYA	Rhaniya
086213410	NAMALA BHARANI	Bharani
086213411	POLABOENA SAI SUPRIYA	Saisupriya
086213412	SANA KHATOON	Khatoon
086213413	SANIA MAHVEEN	Sania
086213414	THANDA SATHWIK	Sathwik
086213415	VELDANDI POOJITHA	Poojitha
086213416	ARSHIYA NAZNEEN	Arshiya

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Q. Explain about diseases?

A. Disease:- Any condition that impairs the normal functioning of a body or disfunctioning of normal body process is called a disease.

The endogenous biochemical imbalance in humans, animals and plants is called as a disease.

Types of diseases:-

1. Common diseases:- Diseases which arise due to changes in climate, place season. Envt Personal hygiene age called as common diseases.

Eg:- fever, cold, body pains, headache, heart diseases

Air borne diseases:- Diseases caused by pathogen, transmitted through air age termed as "Air borne diseases.

Eg:- Small Pox, Chicken Pox - Varicella zoeks virus, cold - Rynovirus, TB - Bacterial infection.

Water borne diseases:- Disease caused by pathogens transmitted through water are termed as "water borne disease".

Eg:- Typhoid - Salmonella Typhe bacteria.

Chlocra - E-coli (Escherichia Coli)

Jaundice - Hepatitis - A.

Insect borne disease: Disease caused by insect borne like housefly, bugs, are called insect borne disease.

Eg:- Malaria - Anaphilis mosquitoes.
dengue fever - Aedes mosquitoes.
chicken gunia - chicken gunia virus

Heridetory disease:- These are genetic diseases caused by genetic mutation that are heriditory.

Eg:- Woman syndrome - Agenetic chromosome disorder
Bold head.
Haemophilia.
Sickle cell anaemia (Damage of blood cells).

Communicable disease:- Those disease spread from person to person are considered as communicable diseases.

→ They may caused by micro organism such as bacteria, viruses, parasites, directly or indirectly from one person to another.

→ Some are transmitted through bites from insects while other are caused by ingesting contaminated food or water.

Eg:- Tuberclosis.

Non-Communicable disease:- These are non-transmitsible. That means they do not spread from one to another person.

Eg:- Diabetic - Auto immune disease, Cancer etc.

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Class : BSc

Group : NDZC

Subject : Chemistry

Topic : 1) Nomenclature of drug

2) Classification of drug

Date : March 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086213901	ANEESHA	
086213902	ANURU KISHORE LAXMI TULASI	
086213903	ATIKETI SAI PRASANNA	
086213904	BANDARI SOWMYA	
086213905	BOINE PRATHYUSHA	
086213906	GUGULOTHU ANITHA	
086213907	GUJULA SHIVANI	
086213908	KARISHMA	
086213909	MANDADAPU DIVYA	
086213910	MANKANI SHARANYA	
086213911	MATURI SRAVANI	
086213912	MUDDAM RUCHITHA	
086213913	MUNIGANTI ABHINAYA	
086213914	POGULA MAHESH	
086213915	RAMANUJAM SWETHA	
086213916	RAVANAVENI ROHITH	
086213917	SHIFA SADAF	
086213918	SOMA SWAPNIKA	
086213919	SUMAIYA NOUSHEEN	
086213920	SYEDA SADIYA SAMAN	

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

3) Explain about drug nomenclature and explain about trival names of drugs?

A. Nomenclature of drugs:- Names of drugs can be studied under three headings:-

a. Chemical names:- All drugs are chemical substances that have chemical names, depending upon their molecular structure During drug development & production, chemical names are used the chemical names are complex or general use.

Eg:- Acetyl salicylic acid or 2-acetoxy benzoic acid is familiar as aspirin.

b. Generic names:- After the production during chemical trials and marketing generic names or non-prospeitary names will be given importance for easy use of non-technical person.

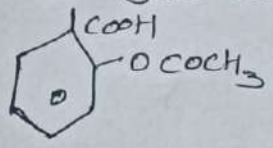
Eg:- Acetyl salicylic acid called as 'aspirin' these names will approved by various higher organisations such as food & drug administration (FDA) etc.

Trade name or Trade mark:-

Commercial developers from pharmaceutical industry select the names depending on drug grouping activity, Ease to recall, drug action, the company Eg - these trade name

given by the company should get acceptance from the same name unless permission is granted.

eg: Aspirin is sold as "wispin"



Chemical name : 2-acetoxybenzoic acid.

Trivial name : Acetyl salicylic acid (ASA)

Generic name : Aspirin.

Trade name : Bufferin, Ecatrin, Empirin.

Explain about classification of drugs?

Drugs age classified into two groups.

i) with respect to the chemical structure,

ii) With respect to the therapeutic action.

Chemical Structure:

There is a relation blw chemical structure and biological activity organic functional group in the molecule age responsible for durg activity. properties like governing drug action at action site, ability to rxn site, dissociation constant, isoterm and bio-isoterism the dry action at active site may be structurdly specific & non-specific. non specific drug biological characteristics depends on physical properties like solubility, vapour pressore distribution, co-efficient. pH levels etc.

* After administration of drug, the drug reaches to the active site, after that the factors like absorption, distribution, bio-transformation and excretion occurs.

ii) Therapeutic action:-

a. chemotherapeutic agents:- Drugs used to fight against the pathogenic organism and are called chemotherapeutic drugs or agents.

→ During the treatmet of infections, diseases, drug will destroy the parasit without damaging the host tissue.

b. pharmacodynamic agents:- The drugs which after the biochemistry of the body to regulate the body age pharmacodynamic agents.

→ These druge react selcatively on the targed of the system of body.

eg:- Central nervous system (CNS), Cardiovascular system.

C. Vitamins & Harmones:-

The supplements age essential to the well being of body vitamins age indispensable micro nutrients that organisms cannot produce by themselves small quantities of vitamins age required for proper function of metabolism harmones serve as chemical messengers from one part of an organism to another.

Vitamins:- Total 13 types of vitamins age essential these age catagorieged into two groups as one is water soluble and another is fat soluble.

Class : BSc

Group : BtMiC

Subject : Chemistry

Topic : 1) ADME (Absorption, Distribution, Metabolism and excretion)

Date : April 2022 – 2023

HALLTICKET_NO	Student Name	Signatre
086213001	ARREM PRATHYUSHA	
086213002	BURA SATHVIKA	
086213003	CHENNABOINA SHRAVYA	
086213004	CHERRIPELLY ANJALI	
086213005	EEKA POOJA	
086213006	GADDAM RAVALI	
086213007	JAMPALA VISHAL	
086213008	KAPIL EEKA	
086213009	KEERTHI UJWALA	
086213010	KONDA KEERTHANA	
086213011	KOYATI NANDINI	
086213012	KOYYALA PRANAY	
086213013	MADURI ROHITH KUMAR	
086213014	MANKALA SHANTH KUMAR	
086213015	MEKALA ROHITH	
086213016	MOHAMMED RABIYA	
086213017	MOTHUKURI PREETHI	
086213018	MUDDAMALA SWARANI	
086213019	MUNUKUNTLA AMULYA	
086213020	NANNUTA HARSHITHA	
086213021	PIDATALA MOUNIKA	
086213022	RACHA LOHITHA	
086213023	SANA TABASSUM	
086213024	SINGU BHAVYA SRI	
086213025	VANGALA VIKRAM	
086213026	VENNA SRIRAM	
086213027	YERRAM SRI KAVYA	

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

59. Explain about ADME (Absorption, Distribution, Metabolism and Excretion) of drugs?

→ Absorption:- Movement of a drug from the site of administration to blood stream is called "Absorption" of drug Generally most of the drugs are absorbed in small intestinal. but drugs spend much less time here due to small surface cross this bi-layer to reach it's site. Acidic drug absorbed in intestine.

Routes of administration of drugs:

The way of taking drug into body system is called drug administration.

1. Orally drugs:- Majority of drugs are taken orally oral Medicines takes around 30min to enter into blood stream and show it's activity. It is most common method
Ex:- Tablets, capsules, Syrups, chewable tablets etc.

2. Parenteral drugs:- The drugs are directly injected into the body is called as "parental drugs". these drugs are oral administration of drugs.

a. Intra muscular (IM):- Drugs which are injected into muscles are called as Intra muscular drugs.

b. Intravenous (IV):- Drugs which injected into veins are called Intravenous drugs.

c. Subcutaneous drugs:- Drugs which are injected under skin are called Substaneous drugs.
Ex:- Insolin.

3. Topical / Cutaneous drugs :- Drugs applied to skin age called topical drugs.
Ex :- Creams, airtments, Sprays etc.
Due to chemical prepn drugs age absorbed either by "Passive diffusion" or "active transpot".
Passive diffusion :- This is facilitated by the Conc^n gradient across the membrane the drug moves from higher conc to lower conc^n. It dosen't require an extra carrier or extra energy.
- Water soluble agents use aqueous pores in the membrane.
- Lipid (fat) Soluble diffuse directly through membrane.
Active transport :- In this process specific carriers and ATP age required. the specific carrier protein carry the drug that closely resemble the Struture of the naturally occuring Metabolities specific from Carrier It is capable of transporting from low to high conc^n compartments.
Distribution :- Movement of drug to various part of body is called distribution.
-> The distribution ability depends on strength of the body.
-> Protein bonding. If the bond is strong the distribution capacity is less.

all these vitamins come from the food. On the other hand body can produce Vitamin D & K.

Water Soluble vitamins:- These vitamins get dissolved in water easily. In circulation it will be utilized by body and excreted from urinary output. As these vitamins cannot be stored in the body consumption of them on daily basis

Eg:- Vitamin A, B, C etc.

Fat Soluble vitiamins:- fat soluble vitamins get dissolved in lipids mainly. These vitamins get absorbed in intestinal. body can store fat soluble vitamins. In moderate limits they help the body in different Metabolism but when they exceed the limits causes hyper vitaminosis and when they lack causes hypo vitaminosis can be caused by fat soluble vitamins only.

Hormones:- Hormones are body chemical messengers they travel in the blood stream to tissue or organs. they work slowely overtime and effect many different processes induding growth & development, metabolism, produced by glands in multi-cellular organisms that are transported by the circulation system to target distant organs to regulate physiology and behaviour

Ex:- Testosterone, Insulin, Estrogen, oxylocin etc.

→ Polar drugs age easily distributed than non Polar drugs.

Distribution of drugs from blood stream to effector Site :-

When the drug is administrated either by intra Vascular injection or by absorption from any of the various extra cellular sites, drug is subjected to differen distribution process to lower the plasma concentrate.

Drug distribution is reversible transfer of a drug blw one compartment to another.

Plasma - protein binding :- The binding of drugs to Plasma Protein is reversible compunds can bind to albumin α-1-acid glycoprotein (AAGP) or lipoprotein in blood.

→ Binding to plasma protein can effect the pharma Cokinetics of the drug substances.

$$\text{Protein} + \text{Drug} \rightleftharpoons \text{Drug - protein complex.}$$

Only the part of drug which is unbound to protein can show activity.

Ex:- warfarin drug is used to prevents Colotting of blood. which is 97% bound to protein, remaining 3% unbounded drugs shown action.

→ If the bonding blw drug and plasma protien is less, then drug can easily travel or diffuse into the cell.

Factors affecting drug distribution:-

1. Blood - flow rate
2. Molecule Size
3. Polarity.
4. Binding to Serum Protein forming Complex.

Metabolism:-

Initial drug consumed will be converted into new compound and this process is called as "Metabolism" Compounds begin to break down as soon as they enter the body. Drug Metabolism is carried out in liver by redox enzymes for majority of small molecule Metabolities are pharmacologically inert.

i) Phase - I - rxn (Non - Synthetic (or) Non - conjugative phase):-

Drug transforms by the process of oxidation reduction and hydrolysis in presence of enzymes the change in drug molecule generally result in introduction of a functional group Molecule or the exposure of a new functional group molecule Small polar functional grup like -OH, NH_2, -SH, -COOH etc. age either added or unmasked on the lipid soluble drug, so that the resulting product may undergo Phase - I reaction.

→ Phase I rxn results in activation, change or inactivation of drug.

ii) Phase II reaction (Synthetic phase):

This is the last step in detoxification reaction and almost always results in loss of biological activity of a compound this may be process by one or more of phase one rxn this involves conjugation of a functional group of Molecules with hydrophilic endogenous substances.

" formation of conjugation". these are form with Endogenous substances such as carbohydrates and amino acids with drugs or it's metabolities formed in phase-I rxn. In this phase rxn attachment of small polar endogenous molecules like gluconic acid, Sulphate Methyl, amino acids etc. to either Unchanged drugs or phase I products. these are called as "conjugates", and these are water Soluble metabolites, which are readily Excreted from body.

Elimination / excretion :-

Used, Modified Metabolities and toxic remains are removed from the body by the way of excretion generally elimination is through urine or in Excreta some of these compounds expelled. through lungs by exhaling sweating. otherwise.

ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

IV– SEM

Class : BSc

Group : FsMiC

Subject : Chemistry

Topic : 1) Job's method

Date : February 2022 – 2023

HALLTICKET_NO	Student Name	Signature
086223402	ADUNURI RAJESH	Rajesh
086223403	BANDARU ANJAN KUMAR	Anjan Sairathy
086223404	CHIKATI SAINADH	
086223405	DOGGELA SOWMYA	Sowmya
086223406	KAMBHAM MAHESH	
086223407	MATIKE ABHIRAM	Abhiram
086223408	MOHAMMAD SAMEERA	Sameera
086223409	MOHAMMED NIHAILSOHAIL	M.D. Nihal
086223410	RAGAM SHIVANI	Shivani
086223411	RAMALLA SUMATHI	Sumathi
086223412	THANGELLA DEEPIKA	Deepika
086223413	THIPPARAPU LASYA	Lasya
086223414	UDUGULA ANIL	Anil
086223415	VANGA MANVITH	Manvith

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VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Q) Determination of composition of complex by continuous variation method (or) JOB's method.

JOB's Method :

Job's method is used to determine the composition of a complex. Different experiment steps are involved in this process are.

(i) Prepare ten solutions in ten different test tubes of a fixed volume of the complex.

(ii) In each test tube different amounts of metal and ligands are to be taken.

(iii) Let the total no. volume of the complex prepared in each of the ten solutions is 10ml.

S.NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Volume of metal ion (ml).	0	1.	2	3	4	5	6	7	8	9
Volume of ligand (ml)	10	9	8	7	6	5	4	3	2	1.

The sum of the concentrations of the ligand (C_L) and metal (C_M) is constant.

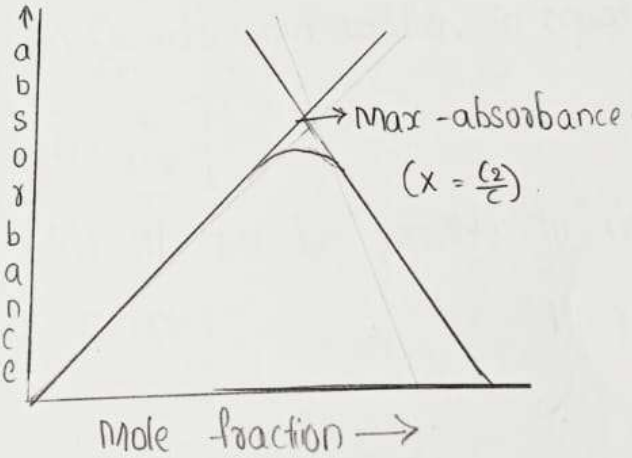
concentration of metal ion = C_M.

concentration of ligand = C_L.

concentration of complex (C) = $C_L + C_M$ ⟶ (1)

(iv) The optical density (absorbance) of each of the solutions is measured by Spectrophotometer.

(v) Values of mole fraction of ligand are plotted against the optical density (absorbance) of Solution.



Now, if the formula of the complex is ML_n, then.

$$n = \frac{C_L}{C_M} \longrightarrow (2)$$

divide the equation (1) by 'C'.

$$\frac{C_L}{C} + \frac{C_M}{C} = \frac{C}{C}$$

$$\frac{C_L}{C} + \frac{C_M}{C} = 1 \longrightarrow (3).$$

But $\frac{C_L}{C} = x$ (mole fraction) $\rightarrow$ (4).

Substitute (4) in (3)

$$x + \frac{C_M}{C} = 1$$

$$\frac{C_M}{C} = 1 - x \rightarrow (5)$$

doing $\frac{(4)}{(5)}$

$$\frac{\frac{C_L}{C}}{\frac{C_M}{C}} = \frac{x}{1-x}$$

$$\frac{C_L}{C_M} = \frac{x}{1-x} \rightarrow (6)$$

Acc. to equation-(2) $\frac{C_L}{C_M} = n$; when written in equation -(6)

$$\boxed{n = \frac{x}{1-x}}$$

based on 'n' value, it can be possible to determine the composition of complex.

Limitations:-

(1) It gives un reliable results when more than one complex is formed in the system.

(2) It is applicable when there is no change in volume on mixing the solution of the metal ion and the ligand.

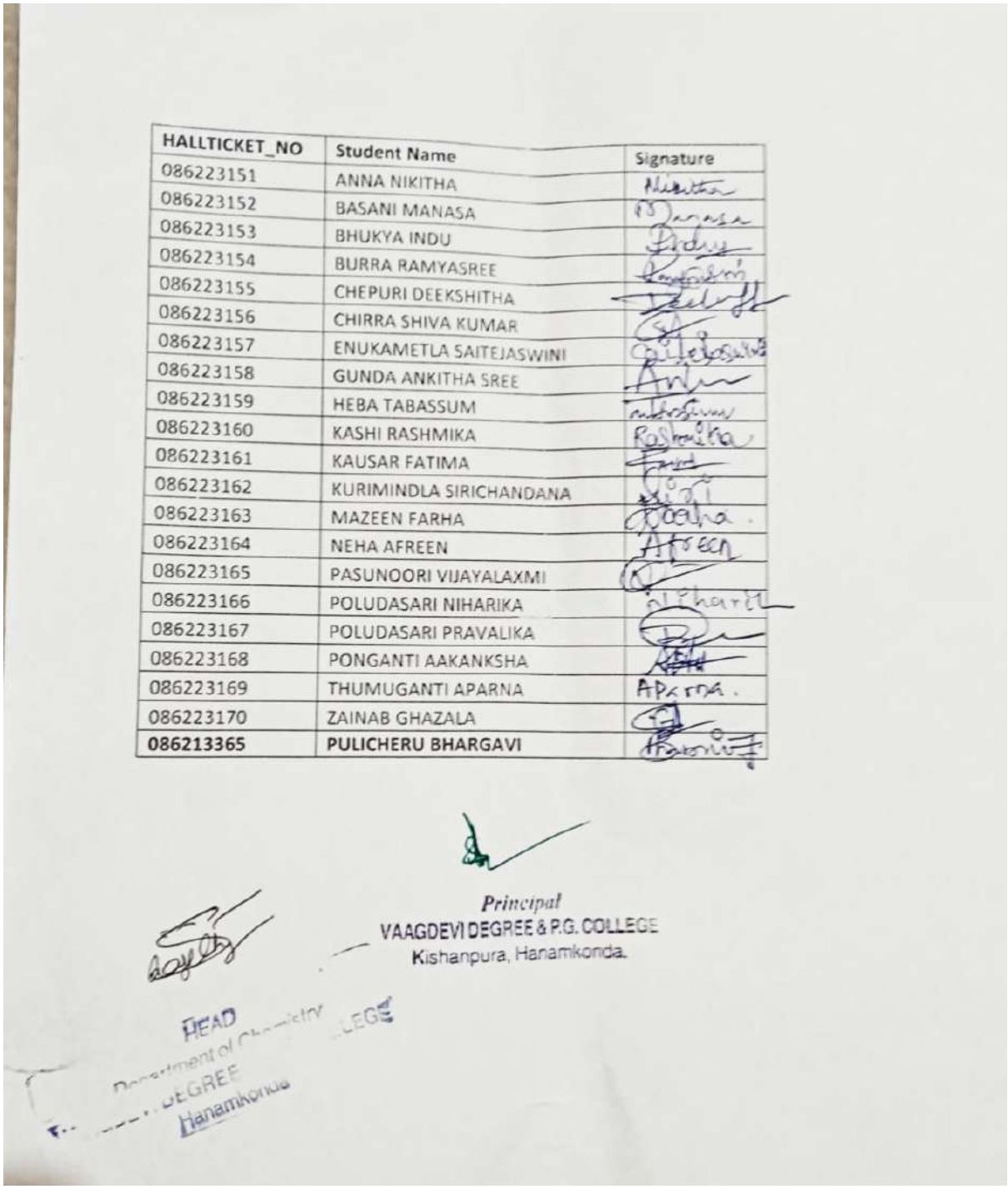
Class : BSc

Group : NDZC

Subject : Chemistry

Topic : 1) Structure elucidation of glucose

Date : March 2022 – 2023



HALLTICKET_NO	Student Name	Signature
086223151	ANNA NIKITHA	
086223152	BASANI MANASA	
086223153	BHUKYA INDU	
086223154	BURRA RAMYASREE	
086223155	CHEPURI DEEKSHITHA	
086223156	CHIRRA SHIVA KUMAR	
086223157	ENUKAMETLA SAITEJASWINI	
086223158	GUNDA ANKITHA SREE	
086223159	HEBA TABASSUM	
086223160	KASHI RASHMIKA	
086223161	KAUSAR FATIMA	
086223162	KURIMINDLA SIRICHANDANA	
086223163	MAZEEN FARHA	
086223164	NEHA AFREEN	
086223165	PASUNOORI VIJAYALAXMI	
086223166	POLUDASARI NIHARIKA	
086223167	POLUDASARI PRAVALIKA	
086223168	PONGANTI AAKANKSHA	
086223169	THUMUGANTI APARNA	
086223170	ZAINAB GHAZALA	
086213365	**PULICHERU BHARGAVI**	

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Kishanpura, Hanamkonda.

HEAD
Department of Chemistry
DEGREE
Hanamkonda

Q. Structural elucidation of Glucose
(Open chain Structure)

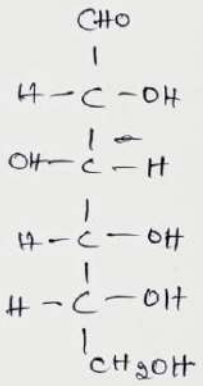
→ Molecular formula $C_6H_{12}O_6$

→ Also called Dextrose / Grape sugar

→ Flame test → Aromatic

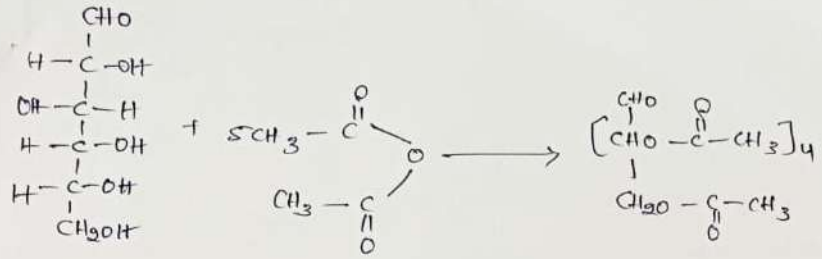
→ Solubility test → Carbohydrates

→ Structure of Carbohydrate.



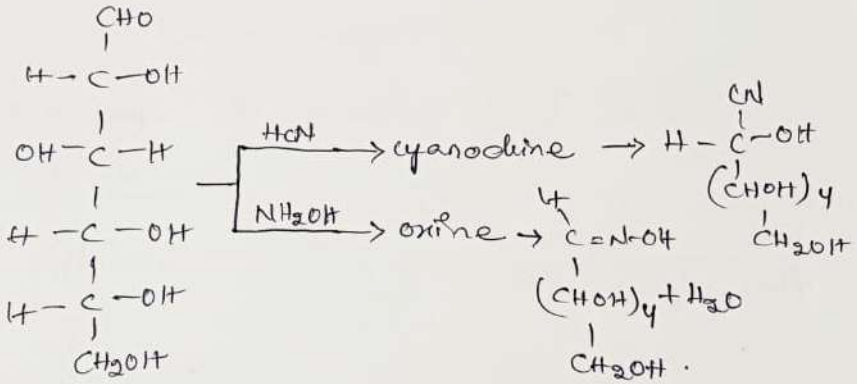
Glucose Structure

* Evidence for presence of 5-OH groups (Acetylation)

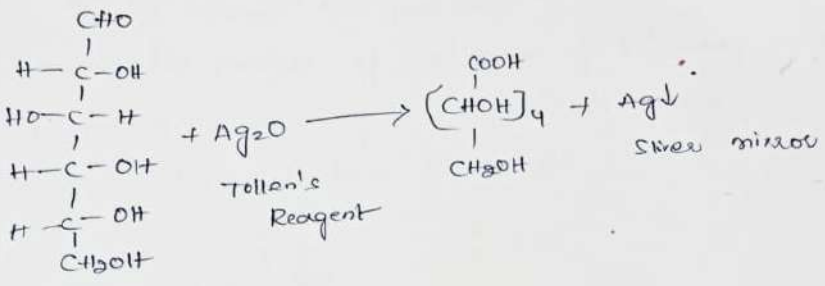


Glucose + Acetic anhydride → penta acetyl derivatives.

* Evidence for presence of Carbonyl group.



* Evidence for presence of Aldehyde group [Tollen's reagent]



Glucose

* Glucose + 2CuO → COOH (CHOH)4 CH2OH + Cu2O ↓ red ppt

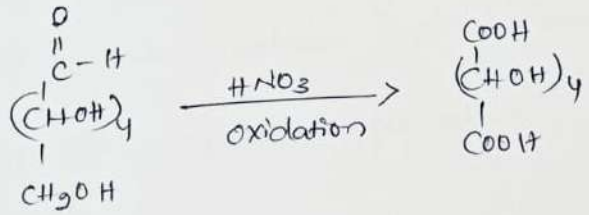
Cuprous oxide

(Fehling's reagent)

* Evidence for presence of 1° Alcohol

Oxidation:-

Glucose $\xrightarrow{HNO_3}$ Saccharic acid / Dicarboxylic acid.



* Evidence for straight chain of Glucose.

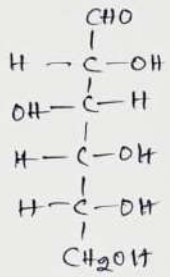
Glucose $\xrightarrow[\text{reduction}]{HI/P}$ n- hexane

'6' Carbons are present

* Evidence for presence of 'OH' group of 5th carbon on left side

Glucose + 3 phenyl hydrazene → Glucosazone.

* Open chain structure of Glucose.



Limitations of open chain ~~reaction~~. structure.

→ It fails to explain the following

1) It does not react with $NaHCO_3$ [sodium bisulphate]

2) It does not react with Ammonia (NH_3)

3) Aromatic nature (cyclic) forms flame test

4) Mutarotation property.

5) Can't restore colour of Schiff's reagent.

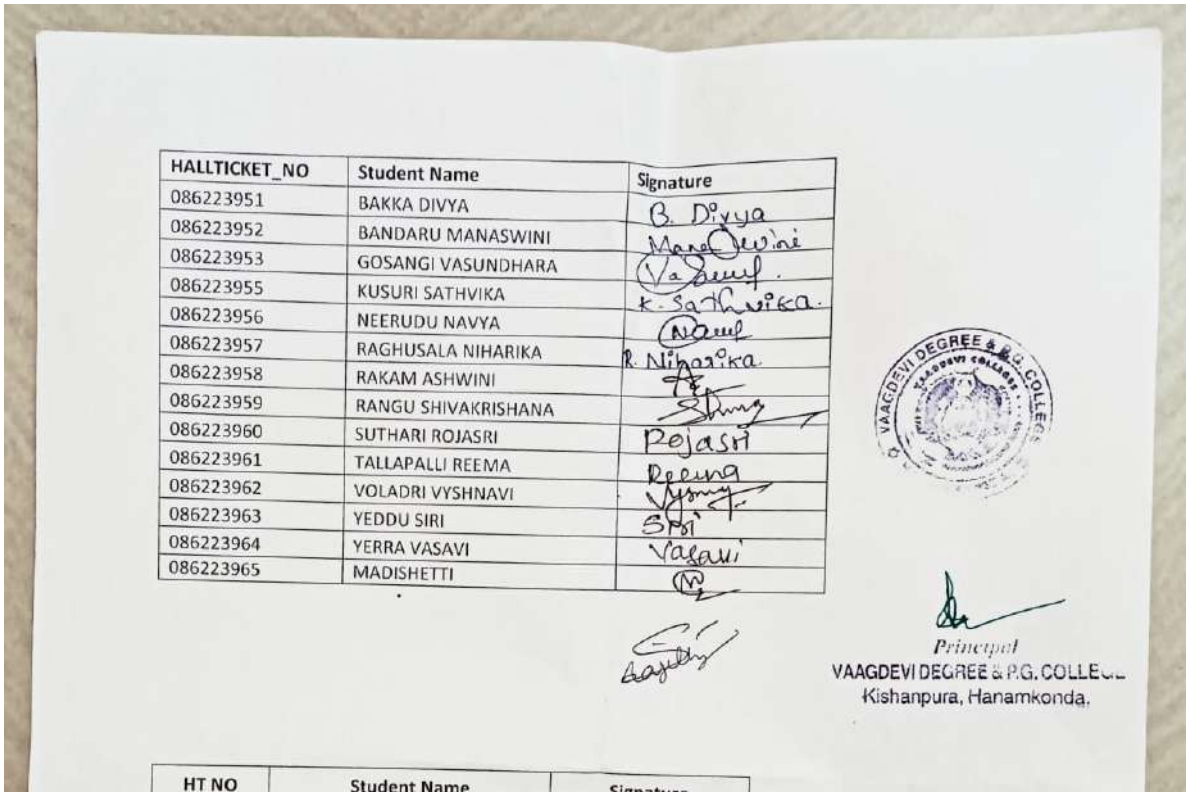
Class : BSc

Group : BtZC

Subject : Chemistry

Topic : 1) Derive rate constant equation for first order reaction

Date : April 2022 – 2023



HALLTICKET_NO	Student Name	Signature
086223951	BAKKA DIVYA	B. Divya
086223952	BANDARU MANASWINI	ManaSwini
086223953	GOSANGI VASUNDHARA	Vasundhara
086223955	KUSURI SATHVIKA	K. Sathvika
086223956	NEERUDU NAVYA	Navya
086223957	RAGHUSALA NIHARIKA	R. Niharika
086223958	RAKAM ASHWINI	
086223959	RANGU SHIVAKRISHANA	
086223960	SUTHARI ROJASRI	Rojasri
086223961	TALLAPALLI REEMA	Reema
086223962	VOLADRI VYSHNAVI	
086223963	YEDDU SIRI	Siri
086223964	YERRA VASAVI	Vasavi
086223965	MADISHETTI	

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Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

HT NO	Student Name	Signature

HT. NO!-086J13354

Q) Derive the rate constant equation for first order reaction.

The relations whose rate is determined by the change of only 1 concentration term are known as 1st order reaction.

$A \longrightarrow$ products

at $t=0$; a 0

after time 't' is ; $a \to x$ 0

rate of reaction $\propto$ (reactants)^n ; here $n=1$

$$r = \frac{dx}{dt} \quad \frac{dx}{dt} \propto (a-x)^1$$

$$\frac{dx}{dt} = k_1 (a-x)$$

where

k_1 = first order rate constant

$$\frac{dx}{(a-x)} = k_1 \cdot dt$$

on integrating the above equation

$$\int_0^x \frac{dx}{(a-x)} = k_1 \int_0^t dt$$

$$-\left[\ln (a-x)\right]_0^x = k (t)_0^t + C$$

$-\ln (a-x) = kt + C \longrightarrow (1)$ where C = integration constant

when $t=0$; then $x=0$; sub in equation $-$ (1)

$-\ln (a-0) = k(0) + c$

$-\ln a = 0 + c$

$-\ln a = c \rightarrow (2)$

Sub eq (2) in (1)

$-\ln (a-x) = kt - \ln a$

$\ln a - \ln (a-x) = k_1 t$

$\ln \frac{a}{a-x} = k_1 \cdot t \quad \therefore \ln \frac{a}{b} = \ln a - \ln b$

$k_1 = \frac{1}{t} \ln \frac{a}{a-x}$

but, $\ln = 2.303 \log$

$k_1 = \frac{2.303}{t} \log \frac{a}{a-x}$

i) Units:-

$k_1 = \frac{2.303}{t} \log \frac{a}{(a-x)}$

$k_1 = \frac{2.303}{sec} \cdot \log$

$k_1 = sec^{-1}$

Half life:- The time taken to complete 50% of a reaction called half life

$k_1 = \frac{2.303}{t} \log \frac{a}{(a-x)}$

When $t = t_{1/2}$; then $x = \frac{a}{2}$

$k_1 = \frac{2.303}{t_{1/2}} \log \frac{a}{(a-x)}$

$k_1 = \frac{2.303}{t_{1/2}} \log \frac{a}{\left(\frac{a}{2}\right)}$

$k_1 = \frac{2.303}{t_{1/2}} \log 2$

$\log_{10} = 0.3010$

$K_1 = \frac{2.3010}{t_{1/2}} \times 0.3010$

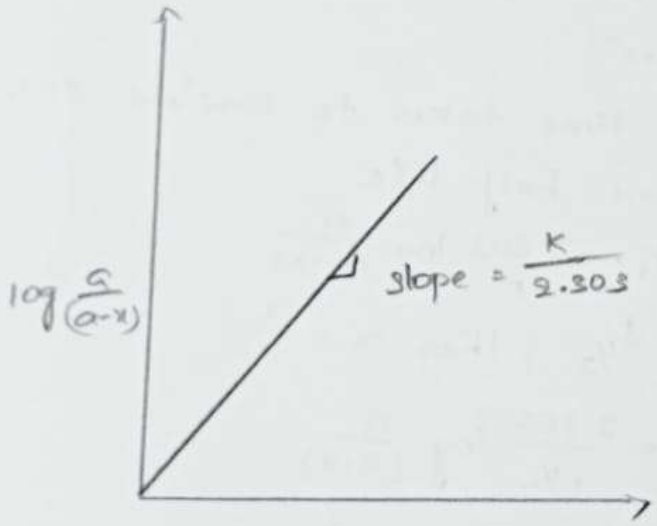
$K_1 = \frac{0.693}{t_{1/2}}$

$t_{1/2} = \frac{0.693}{K_1}$

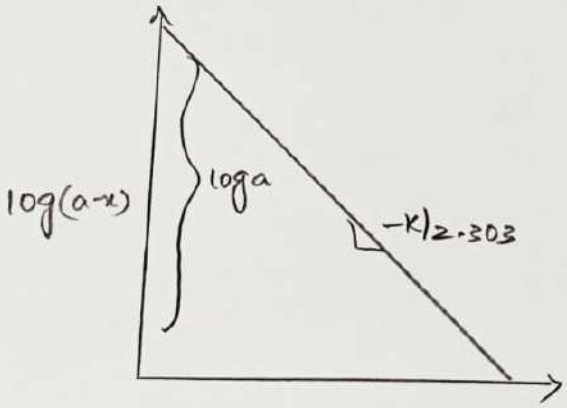
∵ for a first order reaction, half life is independent on the initial concentration of reactions.

Graph :-

When a graph is plotting between $\log\left(\frac{a}{a-x}\right)$ and 't' the line is passing through origin. Then the slope is equal to $\frac{K}{2.303}$



(ii) When a graph is plotting $\log(a-x)$ against 't' shape is equal to $-\frac{k}{2.303}$.



ASSIGNMENT RECORD

2022 – 2023

DEPARTMENT OF CHEMISTRY

ASSIGNMENT

II– SEM

Class : BSc

Group : MiCCS

Subject : Chemistry

Topic : 1) Explain about SN^1 reaction

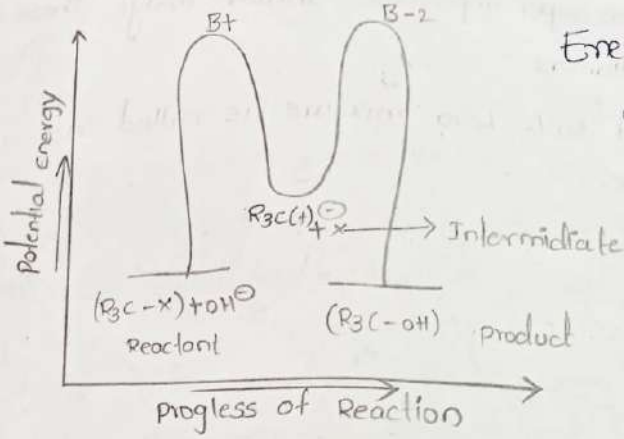
Date : March 2022 – 2023

HT NO	Student Name	Signature
086233651	ADAPA KOUSHIK	
086233652	ALLURI POOJITHA	
086233653	DIVITI SRITEJA	
086233654	GANGINENI SAGAR	
086233655	ILAVENI HARIPRIYA VYSHNAVI	
086233656	JADI THARUN	
086233657	KODAPAKA ISHWARYA	
086233658	KORUKOPPULA SINDHU	
086233659	MARRI AKHILA	
086233660	MEDIDHI ANUSHA	
086233661	NADENDLA AKSHITHA	
086233662	OGGUMALA SRAVANTHI	
086233663	PODILA LOHITHA	
086233664	THANDRA BRUNDA	
086233665	VALGUBELLY SANGEETHA	
086233666	VANGARI DATTATHREYAH	

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.



Energy profile diagram of SN^1

→ The energy profile diagram shows two transitinal stage with carbocation as intermediate

→ In the first step Ionization of alkyl halide result in the formation of carbocation

→ It is highly endothermic and it requires high activation energy

→ Due to high activation energy it is a slow step Hence the rate the reaction depends upon the step.

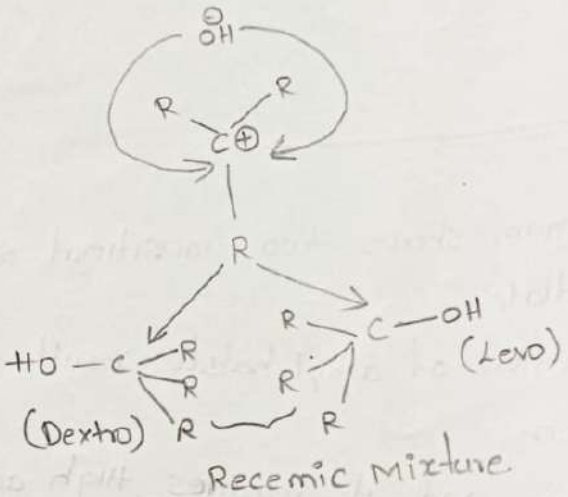
→ In the second step (or) second transitinal stage the nucleiophyle attack the carbocation is highly exothermic It has low activation energy so it is the first step.

Stereo chemistry SN' reaction

SN' reaction the carbocation produced the carbocation is sp^2 hydridised due to these reason the nucleophyle is attacked

to the carbocation towards the left side are towards right side and produced resemic mixture --- The compounds are non super impossible mirror image these are called as enantiomers.

→ 50%. Dextro and 50%. Levo mixture is called as Recemic mixture.



Ex:- 3° Butyl Bromide

Reaction:- $H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-Br + aq\ KOH \longrightarrow H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-OH$

3° Butyl Bromide — 3° Butyl alcohol

Mechanism:-

step 1:- $H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-Br \underset{\text{Rate determinating step}}{\overset{\text{slow step}}{\rightleftharpoons}} H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C\oplus}}$

step 2:-

$H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C\oplus}} \xrightarrow[\ominus OH]{\text{Fast step}} H_3C-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-OH$

→ Tertia Teritary Butyl Bromide react with aquorous ptossium hydroxide and produce teritary Butylal alchol

→ This reaction takes place in the presence of protetic solvent.

→ In this Reaction low consentration nucleiphyle

→ This Reaction takes place in two steps.

→ In the 1st place teritary butyl bromide is converted to teritary carbocation in the slow step and late determining step.

- The rate of the reaction depending upon the concentration of teritary butyl bromide so it is called as rate determining step.

- In step 2 unstable carbocation is react with low concentration nucleiophyle in the test step and produce and teritary alochol and butyal alchol

$$\text{Rate} \propto \left[H_3C - \overset{\overset{CH_3}{|}}{\underset{|}{C}} - Br \right]$$

(or)

$$\text{Rate} \propto [3^0 \text{ Butyl Bromide}]$$

Class : BSc

Group : BZC

Subject : Chemistry

Topic : 1) Ostwald dilution law

Date : Febraury 2022 – 2023

H.T.No	Student Name	Signature
086233301	AKIREDDY SRILEKHA	Srilekha
086233302	BALLA RAGHU	Raghu
086233303	BASHABOINA POOJITHA	Poojitha
086233304	DEEGUNTLA GANESH	Ganesh
086233305	DENKANI NITHIN	Nithin
086233306	DONGRE SREEJA	Sreeja
086233307	GADDAM KAVYA	Kavya
086233308	GANGADHARI AKSHAYA	Akshaya
086233309	KOUTAM SUCHITHRA	Suchithra
086233310	KUDURUPAKA RAMYA	Ramya
086233311	MALLELA MEGHAMALA	Meghana
086233312	MAMIDI NITHIN	Nithin
086233313	MOTHUKURI SADHIKA	Sadhika
086233314	MUNIGADAPA NANDINI	Nandini
086233315	MUNIGALA DEEPIKA	Deepika
086233316	NEERATI BUNNY	Bunny
086233317	POLU AKHILA	Akhila
086233318	PRATHAPANENI NAVYA	Navya
086233319	PURUSHOTHAM SUVARTHA	Suvartha
086233320	RAJABOINA AKHILA	Akhila
086233321	RODDA ABHINAYA	Abhinaya
086233322	SATHU RAMYA SRI	Ramya
086233323	SIDDABOINA SHYAM SUNDER	Shyamsunder
086233324	THOTA ANJALI	Anjali
086233325	UPPULA SRUTHI	Sruthi
086233326	VANGA SANDEEP	Sandeep
086233327	VOLLALA SUSHMA	Sushma
086233328	BANOTH HEMANTH	Hemanth
086233329	BHUKYA RAKESH	Rakesh
086233330	POTHA NIKITHA	Nikitha

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Kishanpura, Hanamkonda.

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

Ostwald's dilution law:

This law is applicable only in weak electrolytes. It is according to Ostwald's dilution law.

$$AB \rightleftharpoons A^+ + B^-$$

$$K = \frac{(A)(B)}{(AB)}$$

→ initial 1 mole

after $(1-\alpha)$, α , α

$$K = \frac{[A^+][B^-]}{[AB]}$$

$$K = \frac{\frac{\alpha}{V}\frac{\alpha}{V}}{\frac{(1-\alpha)}{V}}$$

$$K = \frac{\frac{\alpha^2}{V^2}}{\frac{(1-\alpha)}{V}}$$

$$K = \frac{\alpha^2}{V^2} \times \frac{V}{(1-\alpha)}$$

$$K = \left[\frac{\alpha^2}{V(1-\alpha)}\right]$$

Concentration of any electrolyte

$= K = \frac{c\alpha^2}{(1-\alpha)}$

$= (1-\alpha)$ negligble $\boxed{c = \frac{1}{v}}$ concentration of solution

$= \boxed{K = c\alpha^2}$

Class : BSc

Group : BtMiC

Subject : Chemistry

Topic : 1) Interhalogen compounds

Date : April 2022 – 202

HT NO	Student Name	Signature
086233001	ADEPU DEEPTHI	Deepthi
086233002	AKULA KALYANI	Kalyani
086233003	ALLABOINA GREESHMIKA	Greeshma
086233004	ANABHATHULA UMESH	Umesh
086233005	ARUKALA RAHUL	Rahul
086233006	BANOTH SWAPNA	Swapna
086233007	BOMMATHI LASYAVARDHINI	Lasya.
086233008	BUKYA SWATHI	Swathi
086233009	KARANGULA SUCHITHA	Suchitha.
086233010	KUNAL BHADRA	Bhadra.
086233011	KUNDARAPU HARINI	Harini
086233012	MANDA MOKSHAGNA	Mokshagna
086233013	MANDA RAVEENA	Raveena.
086233014	MANTHENA ROHITHA	Rohitha
086233015	MEDIPELLY SOUMYA	Soumya
086233016	MEENA RINKU	Rinku
086233017	MEKALA VINITHA	Vinitha
086233018	SETTY SATHWIKA	Sathwika
086233019	SHANIGARAM SAI VAMSHI	Sai vamshi
086233020	THOKALA ASHWINI	Ashwini
086233021	NERA AISHWARYA	Aishu

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

HEAD
Department of Chemistry
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

Interhalogens :-

→ Each halogen can combine with other halogen under suitable conditions to form a new type compounds know as inter halogen compounds (or) inter halogens.

→ General formula of inter halogen compounds in AX_n

A = less EN halogen X = more EN halogen

classification :-

Inter halogen are classified into 4 types

AX, AX_3, AX_5, AX_7

AX	AX_3	AX_5	AX_7
ICl	ICl_3	IF_5	IF_7
ClF	ClF_3	BrF_3	
BrF	BrF_3		
BrCl	—		
IF	—		

preparation :-

① Direct combination :-

By the direct combination the two halogens to form inter halogen compounds.

$$ClI_2 + F_2 \xrightarrow{200^\circ C} 2ClF$$

$$I_2 + Cl_2 \longrightarrow 2ICl$$

$$Cl_2 + 3F_2 \xrightarrow{300^\circ C} 2ClF_3$$

$$Br_2 + 3F_2 \longrightarrow 2BrF_3$$

$$Br_2 + 5F_2 \longrightarrow 2BrF_5$$

Indirect Method:-

By the action of a halogen on a lower inter halogen to form another inter halogen compound.

$$IF_5 + F_2 \xrightarrow{200\text{-}300^\circ C} IF_7$$

$$ICl + Cl_2 \longrightarrow ICl_3$$

Class : M.Sc

Subject : Chemistry

Group : Organic chemistry

Topic : 1) Florence life time and Florence quenching.

2) Write about Carbozole

Date : March 2022 – 2023

Vaagdevi Degree & P.G College

Kishanpura,Hanamkonda

M.Sc III SEM (CHEMISTRY) NOMINAL ROLLS - 2022

H.T.NO.	NAME	SIGNATURE
22117-S-0601	KATUKURI SRAVANI	Sravani
22117-S-0602	MOTE DIVYA	Divya
22117-S-0603	CHUNCHU NAVYA	Navya.
22117-S-0604	MOGILICHERLA SNEHA	Sneha
22117-S-0605	PRATHYUSHA RAVULA	Prathyusha
22117-S-0606	THOTA RAMYA	Ramya
22117-S-0607	MERUGAVENI SATHISH	Sathish.
22117-S-0608	BOKKA SPANDANA	Spandana
22117-S-0609	VEERAGONI SRITHASRI	Srithasri
22117-S-0610	GORLA MOUNIKA	Mounika
22117-S-0611	GODISHALA AKHILA	Akhila
22117-S-0612	RAKAM SINDHUJA	Sindhuja
22117-S-0613	DAMERA SRAVANTHI	Sravanthi
22117-S-0614	SOLLETI MOUNIKA	Mounika
22117-S-0615	JELLA SHRUTHI	Shruthi
22117-S-0616	GOSULA ARUN KUMAR	Arun kumar.
22117-S-0617	AKULA KALYANI	Kalyani
22117-S-0618	KUVARAPU ROHITH	Rohith
22117-S-0619	LAKAVATH SAIDU	Saidu
22117-S-0620	JATOTH MANJULA	Manjula
22117-S-0621	MOTTE ANJALI	Anjali
22117-S-0622	MANCHALA BIKSHAPATHI	Bikshapathi.
22117-S-0623	DEVANAPALLY PAVAN	Pavan
22117-S-0624	KAMPELLA NAVEEN	Naveen.
22117-S-0625	KANDULA RANJITH	Ranjith
22117-S-0626	TIPLE SRIKANTH	Srikanth
22117-S-0627	GOGULA MOUNIKA	Mounika
22117-S-0628	BANOTHU CHANDANA TEJA	Chandana Teja
22117-S-0629	PERVARAM VAAGDEVI	Vaagdevi
22117-S-0630	VELPULA.SWETHA	Swetha.
22117-S-0631	GAJJALAKONDA DINESH	Dinesh
22117-S-0632	D.PRAVALIKA	Pravalika
22117-S-0633	MD.NAZIYAFARHEEN	Naziyafarheen
22117-S-0634	BOORA ARCHANA	Archana
22117-S-0635	NAGOTU PREMSAI	Premsai
22117-S-0636	M.DILEEP	Dileep.

Prin

VAAGDEVI DEGR

1) Flourescence life time and Flourescence quenching?

Flourescence life time (FLT) is the time a flourophere spends in the excited state before emitting a photon & returning to the ground state.

FLT can vary from pico seconds to hundreds of Nanoseconds depending on the Flourophere.

FLT is not an intinsic property of a flourophere, FLT does not depend upon flourophere concentration, absorption by the sample, sample thickness, method of measurment. The flourescence life time is calculated by the following equation.

$$T = 1/K_f + K_{nr}$$

T = Flourescence life time.

K_f = Radiative decay rate.

K_{nr} = Non Radiative decay rate.

Flourescence quenching: decrease of flourescence intensity by interaction of the excited state of the flouresphere with it's surrangs is known as Quenching. It is classified into 3 types i.e

1) Collision/Dynamic Quenching: In this process collision returns flourophere to Ground state without photon emission

2) static Quenching: In this process excited state compounds or e⁻ formed as a complex non flouroscend material.

3) Apparent quenching!- Turbidity optical density of flour phere caused for this type of Quenching

2) Write the Applications of Flourescence spectroscopy?

Ans) ① Indicator for DNA Hybridisation!- In DNA Hybridisation flourophere and quenever molecules become attached to ends of single strand DNA & close to one another causing a loop. As DNA becomes hybridised & attaches to another single strand DNA chain the flourophere quencher complex is cleaved allowing for the flourophore to generate light.

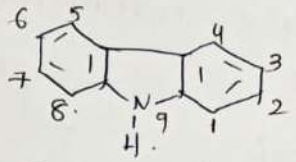
② DNA Interaction with metal ion!-

Interaction of DNA with metal ions also identified with the help of flourescence quenching Ex! The ends of short DNA fragment connected with a flourescent dye & quencher through a covalent bond, are divided in a solution. The Dye is producing light.

③ DNA Interaction with Drugs!-

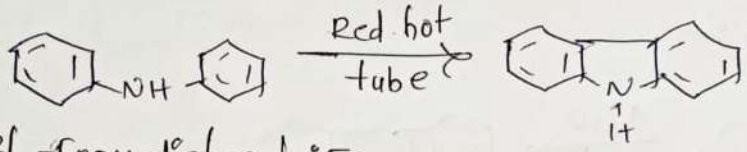
The effective interaction of drugs with DNA usually causes a significent enancement of the flourescence intensity as a consequence of different factors. Thus in the case of interchelating drugs the molecules are inserted into the base stack the helix.

write about carbazole?

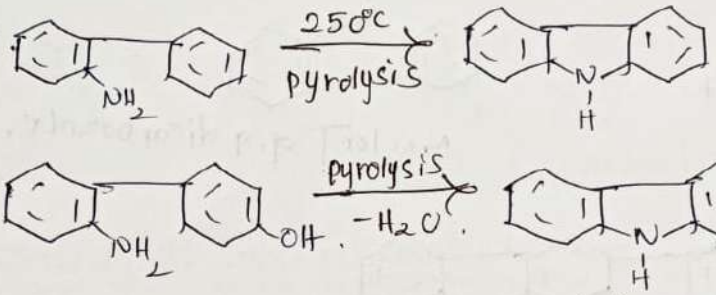


synthetic methods :=

1) from Biphenyl :=

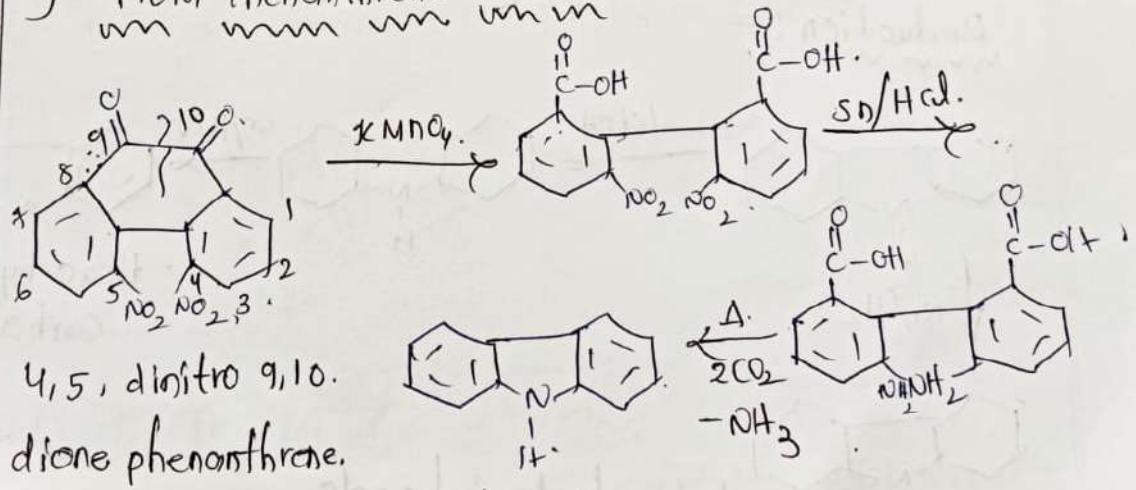


2) from diphenyl :=



2-hydroxy carbazole.

3) from phenanthrene derivative :=



4,5, dinitro 9,10. dione phenanthrene.

Carbazole.

properties :=

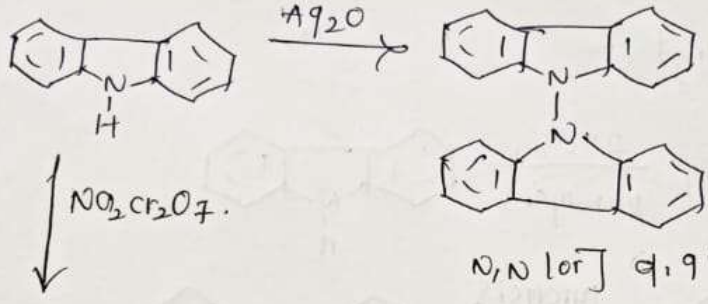
⇒ Carbazole is a solid, 245-247° C - Melting point.

⇒ It is an aromatic compound.

⇒ Is Resonance energy 74 k.cal.

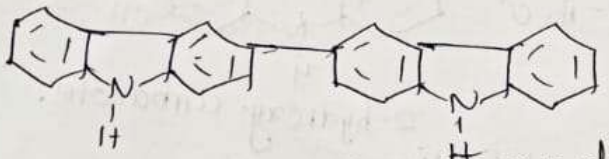
⇒ N-H bond carbazole shows acetic property and its reacts with Grignard reagent.

Oxidation :=



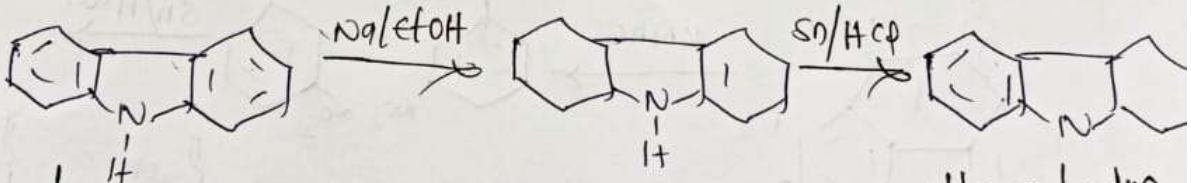
$Na_2Cr_2O_7$.

N,N [or] 9,9 dicarbazole.



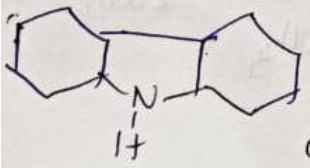
3,3 dicarbazole.

Reduction :=



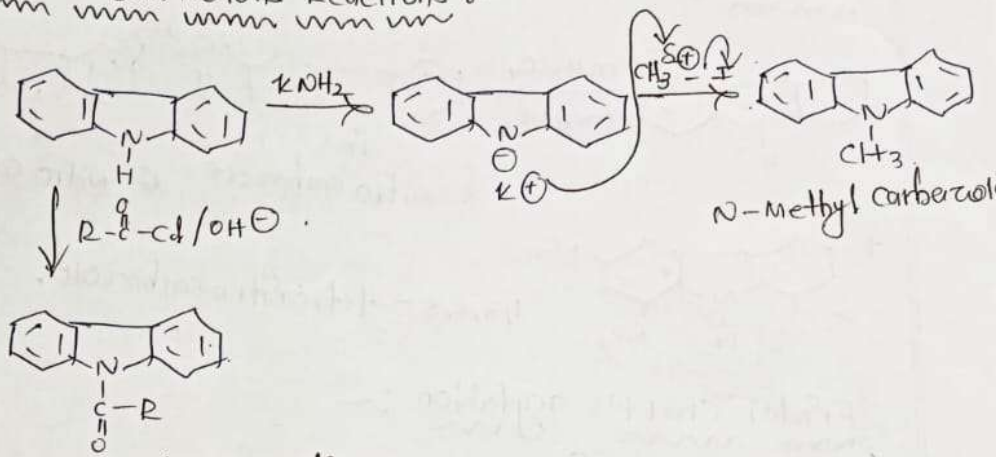
Ni/H_2

- Hexa hydro carbazole

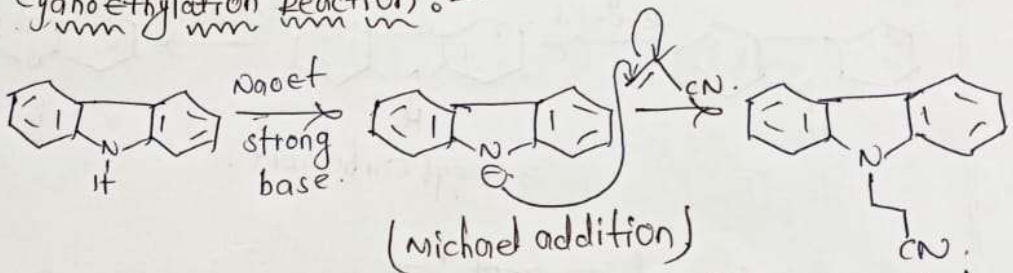


dodeca hydrocarbazole

N- substitutions Reactions :-

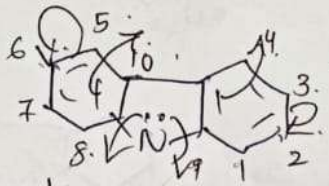


Cyanoethylation Reaction :-



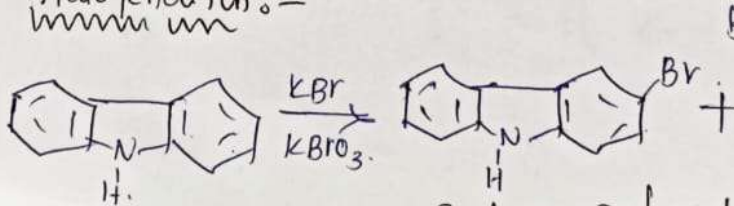
electrophilic substitution reactions :- [β-cyanoethyl carbazole].

→ The carbazole is an aromatic compound. an undergoes electrophilic substitution reactions.



→ e⊕ attacks at 3, 6th positions.

Halogenation :-



VAAGDEVI DEGREE AND PG COLLEGE

Affiliated to Kakatiya University

Accredited with 'A' grade by NAAC

DEPARTMENT OF ENGLISH

2023 - 24 Assignment

Class: BSC III Semester.
Subject: English
Group: MECS EM.
Topic: Achieving Gender equality in India.
Date: 23/09/2023.

VAAGDEVI DEGREE & P.G. COLLEGE

Kishanpura, Hanamkonda

III semester Nominal Rolls 2023-2024

MECS II SEM

S No	Admission No	HALL TICKET NO	Student Name	Signature
1	24-4-914	086244001	AKULA ANJALI	A. Anjali
2	24-4-913	086244002	BOLUMALLA RUCHITHA	Ruchitha
3	24-4-903	086244003	BYRABOINA RISHI	
4	24-4-904	086244004	GULLA SAKETH	G. Saketh
5	24-4-915	086244005	KANKANALA VARUN REDDY	Varun
6	24-4-911	086244006	PONNALA VINAY	Vinay
7	24-4-917	086244007	THOTAPALLY RANJITHA	T. Ranjitha
8	24-4-916	086244008	VILASAGAR RAJESH	Rajesh
9	24-4-902	086244009	BETHAMALLA RACHNA	B. Rachana
10	24-4-905	086244010	DASARI UDAYKIRAN	Udaykiran
11	24-4-910	086244011	ELLAVULA KARTHIK	E. Karthik
12	24-4-906	086244012	LAKKAKULA AKSHAY	AKShay

A. [illegible]
Sig of Principal

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Vaagdevi Degree & P.G. College
Kishanpura, Hanamkonda

2023-24 Assignment

Class: BSC V Semester.
Subject: English
Group: MIZC EM
Topic: Why we love holiday rituals & traditions.
Date: 21/03/2024.

VAAGDEVI DEGREE & P.G. COLLEGE

Kishanpura,Hanamkonda
V Semester Nominal Rolls 2023-24

Course:MIZC (EM)

SNo	Admission No	HALLTICKET_NO	Student Name	Signature
1	22-3-715	086223601	ADLURI VARSHITHA	A. Varshitha
2	22-3-702	086223602	BALLA MAMATHA	Mamatha
3	22-3-708	086223603	BOGE VIVEKNANDAN	Vivek
4	22-3-714	086223604	GUNTI SATHWIKA	Sathwika
5	22-3-713	086223605	KANNURI VAMSHIKRISHANA	Vamshi
6	22-3-703	086223606	KARNE SOUJANYA	K. Soujanya
7	22-3-707	086223607	KOLIPAKA VIVEK KUMAR	Vivek
8	22-3-704	086223608	MALLEPELLI BHAVANI	Bhavani
9	22-3-712	086223609	MANDALA VENNELA	M. Vennela
10	22-3-709	086223610	MOHAMMED ALTHYAF RAHMAN	
11	22-3-719	086223611	MUDEPELLI SANDEEP	Sandeep
12	22-3-701	086223612	GOLLAPELLI ASHWITHA	G. Ashwitha

A. Sarikanth
Sig of Principal.

Principal
Vaagdevi Degree & P.G. College
Kishanpura, Hanamkonda

Viswambhara Educational Society's

VAAGDEVI DEGREE AND PG COLLEGE

(Affiliated to Kakatiya University)

Warangal ,Telangana.

Fieldtrips and Educational tours organized by Department of Microbiology

MICROBIOLOGY

ASSIGNMENT

NAME :- VUSHAKOYALA NAVYA

COURSE :- B.Sc. M.Z

SEM :- VI

HALL TICKET No. :- 086223810

TOPIC :- WATER-BORNE DISEASES

Sd. [signature]

A. [signature]

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VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

WATER-BORNE DISEASES

Protozoa:-

Disease & Transmission	Microbial Agent	Source of Agent in Water Supply	General Symptoms
Acanthamoeba keratitis (Cleaning of contact lenses with contaminated water)	Acanthamoeba (A. castellanii & A. polyphage)	Widely distributed free living amoeba found in many types of aquatic environments, including surface water, tap water, swimming pools, & contact lens solutions.	Eye pain, eye redness, blurred vision, sensitivity to light, sensation of something in the eye & excessive tearing.
Amoebiasis (hand-to-mouth)	Protozoan (Entamoeba histolytica) (Cyst-like appearance)	Sewage, non-treated drinking water, flies in water supply, saliva transfer	Abdominal discomfort, fatigue, weight loss, diarrhea, bloating, fever.
Cyclosporiasis	Protozoan parasite (Cyclospora cayetanensis)	Sewage, non-treated drinking water.	Cramps, nausea, vomiting, muscle aches, fever & fatigue.
Naegleriasis (primary amoebic meningoencephalitis [PAM]) (Nasal)	Protozoan (Naegleria fowleri) (Cyst like-appearance)	Water spouts, non-chlorinated water	Headache, vomiting, confusion, loss of balance, light sensitivity, hallucinations, fatigue, weight loss, fever & coma.

Microsporidiosis.	Protozoan phylum (Microsporidia) but closely related to fungi	Encephalitozoan intestinalis has been detected in ground water, the origin of drinking water	Diarrhea & wasting in immunocompised individuals.

Bacteria :-

Disease & Transmission	Microbial Agent	Sources of Agent in Water Supply	General Symptoms
Campylobacteriosis	Most commonly caused by Campylobacter jejuni	Drinking water contaminated with feaces.	Produces dysentery like symptoms along with a high fever usually lasts 2-10 days.
Otitis Externa (Swimmer's ear)	Caused by a number of bacterial & fungal species.	Swimming in water contaminated with responsible pathogens.	Ear canal swells, causing pain & tenderness to the touch.
Salmonellosis	Caused by many bacteria of genus Salmonella.	Drinking water contaminated with the bacteria. More common as a food borne illness.	Symptoms include diarrhea, fever, vomiting & abdominal cramps.
Dysentery	Caused by a no. of species in the genera Shigella & Samonella with most common	Water contaminated with the bacterium	Frequent passage of feces with blood &/or mucus & in some cases vomiting of blood.

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Acute Gastrointestinal illness (AGI) (fecal-oral, spread by food, water, person to person & fomites)	Norovirus	Enters water through the feces of infected individuals	Diarrhea, vomiting, nausea, stomach pain.
Poliomyelitis (Polio)	Poliovirus	Enters water through the feces of infected individuals.	90-95% of patients show no symptoms, 4-8% have minor symptoms with delirium, headache, fever & occassional seizures & spastic paralysis, 1% have symptoms of non-paralytic aseptic meningitis. The rest have serious symptoms resulting in paralysis or death.
Polyoma Virus infection.	Two of polyoma-virus JC virus & BK virus.	Very widespread, can manifest itself in water, ~80% of the population has antibodies to polyomavirus.	BK virus produces mild respiratory infection & can infect the kidneys immunosuppressed transplant patients. JC virus infects the respiratory system, kidneys or can cause progressive multifocal leukoencephalopathy in the brain (which is fatal)

	being Shigella dysenteriae		
Leptospirosis	caused by bacteria of genus Leptospira	Water contamination by the animal urine carrying the bacteria	Begins with flu like symptoms then resolves. The second phase then occurs involving meningitis, liver damage (causes jaundice) & kidney failure.

Viruses:-

Disease & Transmission	Viral agent	Source of Agent in Water Supply	General Symptoms.
Hepatitis-A	Hepatitis-A Virus (HAV)	Can manifest itself in water & food	Symptoms are only acute & include fatigue, fever, malaise, abdominal pain, nausea, diarrhea, weight loss, itching, jaundice & depression.
Hepatitis E (Fecal-Oral)	Hepatitis E virus	Enters water through the feces of infected individuals	Symptoms are of acute hepatitis liver disease, including fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, jaundice, dark urine, clay-coloured stool & joint pain.

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WATER-BORNE DISEASES

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Naegleriasis (primary amoebic meningoencephalitis [PAM]) (Nasal)	Protozoan (Naegleria fowleri) (Cyst like-appearance)	Water spots, non-chlorinated water	Headache, vomiting, confusion, loss of balance, light sensitivity, hallucinations, fatigue, weight loss, fever & coma.

21

2023-2024 III year

Student Assignment

Name of the department - Microbiology

class : Bsc (Microbiology) Isem

No. of students : 78

Name of the topic : Intrinsic & Extrinsic parameters that affects the growth of microorganisms

Total no. of students submited :- 74

G. Chandrakala

HEAD
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

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Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda

Intrinsic and Extrinsic properties

Intrinsic Factors

M.O's can grow in a wide range of pH. The variations in pH values for growth may be due to different strains of a species or different species in a genus. There is an inter relationship b/w pH and other environmental factors. There is pH of the substrate also influence the activity of enzyme systems and the products of metabolism of M.O's

1) pH of food:

The pH of a food along with other environmental factors will determine the types of M.O's that are able to grow and dominate and eventually cause spoilage by a desired fermentation or a potential health hazard. The pH of a food is determined by the acid or alkaline substances. The pH of the food products can change during ripening processing or storage.

Example:

Egg white: This is one of the most alkaline biological substances. The albumin of or freshly laid chicken has a pH approximately of 7.6 when the egg is stored in storeroom the CO_2 from carbonic acid in the albumin is released through the egg shell. When this occurs pH levels are associated with thinning of albumin and a dec in egg quality egg quality is maintained at a albumin pH near 8.2 storage in an atmosphere of CO_2 or oiling the egg shell maintains the pH at a intermediate level.

Red Meat: The pH of the living animal tissue is near to neutral. The circulating blood brings nutrients and oxygen to the cells and remove the waste products of

moisture until equilibrium has been established between food with established like wise food will lose moisture when placed in an environment at low relative humidity. In general the higher the temp. the lower the temp. the higher the relative humidity.

Foods that undergo surface spoilage from molds yeast and certain bacteria should be stored under conditions of low relative humidity. It is possible to lessen the chances of surface spoilage of certain foods by storing under low conditions of relative humidity. It should be remembered that the food itself loses the moisture to the atmosphere under such conditions and these by become undesirable.

3. Presence and effect of gases in the environment:

The storage of food in atmosphere containing increased amounts of CO_2 upto 10% is referred to as controlled atmosphere or modified atmosphere storage. The conc. of CO_2 generally doesn't exceed 10% and is applied either from mechanical sources or by the use of dry ice. CO_2 has been shown to effect the fungal rotting of fruits caused by storage with by fungi. Ozone is effective against mainly of mo's both CO_2 and O_3 are effective against mo's responsible the surface spoilage of beef under long storage.

iii). Mesophiles: The organisms that grow well b/w 20°c to 45°c with optimum b/w 30°c and 40°c are reffered to as mesophiles.

The Psychrophiles are found most commonly on food are those that belong to the genera pseudomonas and enterococcus. These organisms grow well at refrigerated temperature and cause spoilage of meat, fish, poultry eggs and other food normally held at this temperature. The mesophilic orgnism mainly cause spoilage of food that is placed at room temperature most thermophilic bacteria of importance in foods belong to genera bacillus and clostridium. These are of great intrest to the food microbiologist and food technologist in the canning industry.

The quality of food product must also be taken into account in selecting a storage temp or Bananas are better it stored at 17°c. A large no. of vegetables are stored at a temp at about 10°c including potatoes, cabbage etc. Temperature of storage is the most important parameter that effects the spoilage of highly perishable foods.

2. Relative humidity of storage and environment:

The relative humidity of storage environment is important both from the stand point of aw in foods and growth of M.O's at the substances.

When foods with low aw values are placed in environment of high relative humidity, the foods pickup

Biological Structures:

The natural covering of some foods provide excellent protection against the entry and subsequent damage by spoilage organisms. In this category are teat of seeds the outer covering of fruits. The shells of egg etc. The strain covering of fish and meat such as beef and pork prevents the contamination and spoilage of th foods.

Extrinsic factors:

The extrinsic factors of Foods are those properties of the storage environment that effect both the foods and their M.O's the parameters are

1. Temperature of Storage
2. Relative humidity of environment
3. presence and conc. of gases in the environment

1. Temperature of Storage:

M.O's grow over a wide range of temperatu the lowest temp at which M.O's have been reported to grow is 34°c and the highest is 90°c. The M.O's are grouped into three types based on their temp requirme

i) Psychrophiles: The organisms that grow well or b/w and 20°c are reffered to as psychrophiles.

ii) Thermo Mesophiles: The organisms that grow well above 45°c with optimum temp b/w 55°c and 65°c are reffered to as thermophiles

texture on the atmosphere.

Nutrient content

In order to grow M.O's require the following

i) water ii) Source of energy

iii) Source of H_2

iv) Vitamins and related growth factors

v) Minerals

Microorganism can grow only in aqueous sol^n They cannot grow in pure water or in the absence of water dissolves many substances than any other solvent. water is involved in the chemical reactions that break down substrate to usable molecules. As Sources of energy food borne m.o's may utilize carbohydrates such as starch and cellulose M.O's require B-vitamin in low quantities certain elements or minerals found in glucose cellulose components are needed in trace elements by M.O's Na, K, Ca and Mg are needed in large amounts.

Antimicrobial constituents

The stability of some foods against the attack by M.O's is due to the presence of certain naturally occurring substances that have been have shown to have antimicrobial activity Some species are known to contain essential oils that posses antimicrobial activity.

Among these. Eugenol in cloves allicin in garlic, cinnamic aldehyde and Eugenol in cinnamon cows milk contain several antimicrobial substances including Lactoferin conglu -tinin eggs contain Lysozyme which posses antimicrobial activity

metabolism when an animal is slaughtered blood no longer circulates anaerobic conditions develop and meta-abolic products accumulate. The inherent tissue enzymes ferment the muscle glycogen to lactic acid which lowers the pH.

Immediately after slaughtering, the pH of beef muscles is 6.9 to 7.2. The pH of most pork muscles is from 5.8 to 5.6 microbiologically, low pH containing food is the desired one. The pH containing food is the for the growth of pseudomonas that spoil meat is 5.6 meat has an ultimate pH less then 5.6 it would be expected to have longer life.

Chicken:

The pH of the chicken muscles varies similarly to that of red meat slaughtered chicken has a pH of 5.5 to 5.9

Sea food:

The pH of Fish (7.0 - 7.3) is lowered to pH 5.5 - 6.5, depending on the species of fish and the initial amount of glycogen in the muscles. The pH of the canned crab is usually pH 6.8 - 7.4 and pH of brown shrimp is 7.1 - 8.

Fruits and Vegetables:

Fruits generally have a lower pH. Fruits, generally have a lower pH than ripe fruits the ripening important influence the ultimate pH. The only of fruit influence not only the growth of M.O's but also quality factors. Such as softening and discoloration of canned foods. Since, the pH is low, fruits are usually spoiled by mould growth vegetables usually have a higher pH than fruits and are subjected to bacterial spoilage.

b) Moisture content :

Some M.O's can remain alive in a dried condition but cannot carry out their normal metabolic activities or multiply without water. dissolves more substances than any other solvent. The water requirements of M.O's defined in terms of water activity (aw).

Water activity (aw) is defined as the vapour pressure of a solution divided by the vapour pressure of a solvent. The value of water activity range from 0 to 1. The escape of water to the our is measured by the equilibrium relative humidity (E.R.H)

$$a.w = \frac{P}{P_0} = \frac{ERH}{100}$$

Water activity and microbial growth. M.O's have an max., opt. and. aw for growth. Since the aw of pure water is 1.00 and M.O's cannot survive in pure water. The max or upper limit for microbial growth is an aw somewhat less than 1.00. The aw of most fresh foods is above 0.99 in general, for growth bacteria require higher aw than yeast and yeast require a higher aw than molds. Other aspects of aw are also important. These aspects include the germination of spores toxin production resistant to heat.

Most often high aw is required for sporulation than germination. The production of enterotoxin by some requires a high aw than that for growth. The lower the aw the longer the M.O's survive during storage.

Water activity of food :

The aw of Food can be lowered by removing water, by adding solutes or by Freezing fresh foods. Such as Fruits, vegetables, meat, poultry and Fish have aw values of 0.98-

which will allow the growth the most M.O's on products that have low aw due to sugar products (jam jellies or honey) will be subjected to attack by osmo -philic yeasts while products that contain high salt co will be spoiled by halophillic bacteria. Fried foods gen -rally have a aw values below 0.7. A safe aw level of storage is usually considered to be 0.60 or less in protected by low aw enzymatic changes can occurs but a slow rate.

Oxidation - Reduction potential:

When a substance is oxidised it loses $e^{\ominus}$s these $e^{\ominus}$s must be accepted by another substance which then becomes reduced. The oxidation - reduction potential a system is expressed by the symbol 'Eh'. Eh is to meas -re the intensity not the capacity of the system.

Effect on M.O's:

The Microbial cultures the simultaneous oxida -tion and reduction are the sources of energy for cel process. Since energy is needed by the cell to functi

Strictly aerobic M.O's grow only in the pres -nce of free atmospheric O_2. Strictly anaerobic organis survive and include only in the absence of free O_2 facultative anaerobes can grow with/without free O_2, micro aerophilic org's cannot multiply in either entirely aerobic anaerobic conditions. They grow best in a limited amou of O_2.

Redox potential of Foods:

The oxidation - reduction potential of Food depends upon the compositions

2023-2024 - II year

Student Assignment

Name of the department : Microbiology

Class : Bsc (Microbiology) - IV Sem

No. of students : 50

Name of the topic : Prokaryotic & Eukaryotic cell organisation

No. of students submitted :- 48.

G. Chandralekha.

HEAD
Department of Microbiology
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

A. [illegible]

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda

Name: K. Sahithya.
Group: B.Sc. MB- IV Sem

1 General Microbiology.

→ Ultra Structure of Prokaryotic cells:

Prokaryotic cell envelope consists of several layers:

1. Glycocalyx (or slime layer): A loose, gelatinous layer composed of polysaccharides and proteins. It helps protect the cell from desiccation and provides some protection against phagocytosis.
2. Peptidoglycan (or Murein) Layer: A rigid layer composed of peptidoglycan (a polymer of sugars and amino acids). This layer provides structural support, maintains the cell's shape and prevents the cell from bursting due to osmotic pressure.
3. Outer Membrane (OM): A phospholipid bilayer containing various proteins, including porins, which facilitate the transport of molecules across the membrane. The OM is present in Gram-negative bacteria.

Prokaryotic Cell Membrane:

The prokaryotic cell membrane also known as the plasma membrane, is a phospholipid bilayer that surrounds the cell's cytoplasm. It:

1. Regulates the movement of molecules:
   Controls the transport of ions, nutrients, and waste products across the membrane.

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2. Maintains cellular homeostasis:
Regulates the cell's internal environment, including pH, temperature, and osmotic balance.

3. Provides structural support:
Helps maintain the cell's shape and provides a platform for the attachment of various proteins and other molecules.

Cytoplasm and Cytoplasmic Inclusions:

The cytoplasm is the region between the cell membrane and the nucleoid. It contains:

1. Cytoplasmic matrix: A gel-like substance composed of water, salts, sugars and various organelles.
2. Ribosomes: Small organelles responsible for protein synthesis.
3. Inclusions: Specialized structures that perform specific functions such as:

- Mesosomes: Infoldings of the cell membrane that may be involved in cellular respiration or DNA replication.
- Magnetosomes: Membrane-bound structures containing magnetite crystals, which help magnetotactic bacteria orient themselves in magnetic fields.
- Gas Vesicles: Protein-bound structures that provide buoyancy, allowing some bacteria to float or maintain their position in water columns.

Nucleoid:

The nucleoid is the region where the prokaryotic cells genetic material (DNA or RNA) is located. It:

1. Lacks a nuclear membrane: Unlike eukaryotic cells, prokaryotic cells do not have a nuclear membrane surrounding their genetic material.
2. Contains a single circular chromosome: Most prokar-yotes have a single circular chromosome, although some may have multiple chromosomes or plasmids.
3. May contain plasmids: Plasmids are small, self-replicating circular DNA molecules that can carry additional genetic information.

Other Ultrastructural Features:

Other notable ultrastructural features of prokaryotic cells include:

1. Pili (or Fimbriae): Short, hair-like structures that facilitate attachment to surfaces, DNA transfer or motility.
2. Flagella: Long, whip-like structures that provide motility.
3. Cell wall appendages: Structures like S-layers, which provide additional protection and support.

PROKARYOTIC CELLS	EUKARYOTIC CELLS
1. Lack a true nucleus: Genetic material (DNA & RNA) is found in a single circular chromosome in the nucleoid region.	1. True nucleus. Genetic material (DNA) is found in a membrane-bound nucleus.
2. No membrane-bound organelles: No mitochondria, chloroplasts, or other membrane-bound organelles.	2. Membrane bound organelles: Contain various organelles, such as mitochondria, chloroplasts & a golgi apparatus.
3. Small size Typically 1-10 um in diameter.	3. Large size: Typically 10-100 um in diameter.
4. Simple cell structure: Lack a cytoskeleton and the cell wall is composed of peptidoglycan (in bacteria).	4. Complex cell structure: Have a cytoskeleton & the cell wall is composed of cellulose (in plants) or chitin (in fungi).
5. Rapid cell division: Can divide rapidly with some bacteria dividing every 20-30 minutes.	5. Slower cell division: Divide more slowly than prokaryotic cells, with some cells dividing every 24 hours.
6. Limited metabolic processes: Lack the complex metabolic processes found in eukaryotic cells	6. Complex metabolic processes: Have complex metabolic processes, including photosynthesis (in plants) & oxidative phosphorylation (in mitochondria)

Key Differences:

1. Nucleus: Eukaryotic cells have a true nucleus, while prokaryotic cells lack a nucleus.
2. Organelles: Eukaryotic cells have membrane-bound organelles, while prokaryotic cells lack these structures.
3. Cell size: Eukaryotic cells are generally larger than prokaryotic cells.
4. Metabolic processes: Eukaryotic cells have more complex metabolic processes than prokaryotic cells.

(3) Define cells with its parts in detailed with the help of diagram.

⇒ CELL: A cell is the basic structural & functional unit of living organisms. It is tiny membrane-bound entity that contains the fundamental components necessary for life.

CELL COMPONENTS: A cell consists of several components, each with distinct functions.

1. Plasma membrane: A thin, semi permeable membrane (7-10 nm thick) that surrounds the cell and regulates the movement of materials in and out.
   - Composed of phospholipid bilayer with embedded proteins.
   - Controls the exchange of nutrients, waste, & signaling molecules.

2. Cytoplasm:
- A jelly like substance inside the cell membrane where many metabolic processes take place.
- composed of water (70-90%), salts, sugars, amino acids and various organelles.
- Site of glycolysis, protein synthesis and other cellular activities.

3. Genetic Material (Nucleus):
- Contains the instructions for the cell's growth, reproduction and funtion.
- Found in the nucleus (eukaryotic cells) or nucleoid (prokaryotic cells).
- Composed of DNA (or RNA in some viruses) and associated proteins.

4. Organelles: specialized structures with in the cell that perform specific functions. Examples include:

a) Mitochondria: site of cellular respiration, generating energy for the cell through ATP production.

b) Ribosomes: Found in cytoplasm.
Site of protein synthesis, translating mRNA into specific amino acid sequences.

c) Endoplasmic reticulum (ER):
- Found in eukaryotic cells.
- Involved in protein synthesis, folding & transport &
lipid synthesis.

d) Golgi Apparatus:

- Found in eukaryotic cells. Contain digestive enzymes that break down and recycle cellular waste & foreign substances.

e) Chloroplast: Found in plant cells.

Site of photosynthesis, converting light energy into chemical energy.

Cytoskeleton:

- A network of protein filaments that provides structural support, shape & mechanical stability to the cell.
- Composed of microtubules, microfilaments, & intermediate filaments.

Cell Wall:

- A rigid, external layer that provides additional support and protection to the cell.
- Found in plant, bacterial & fungal cells.
- Composed of cellulose (plant cells), peptidoglycan (bacterial cells) & chitin (fungal cells).

These cellular components work together to maintain the cell's homeostasis, facilitate communication & enable the cell to respond to its environment.

2023-2024 - II year

Student Assignment

Name of the department: Microbiology

Class : BSc (Microbiology) - III Sem

No. of Students : 50

Name of the topic : Types of Immune cells.

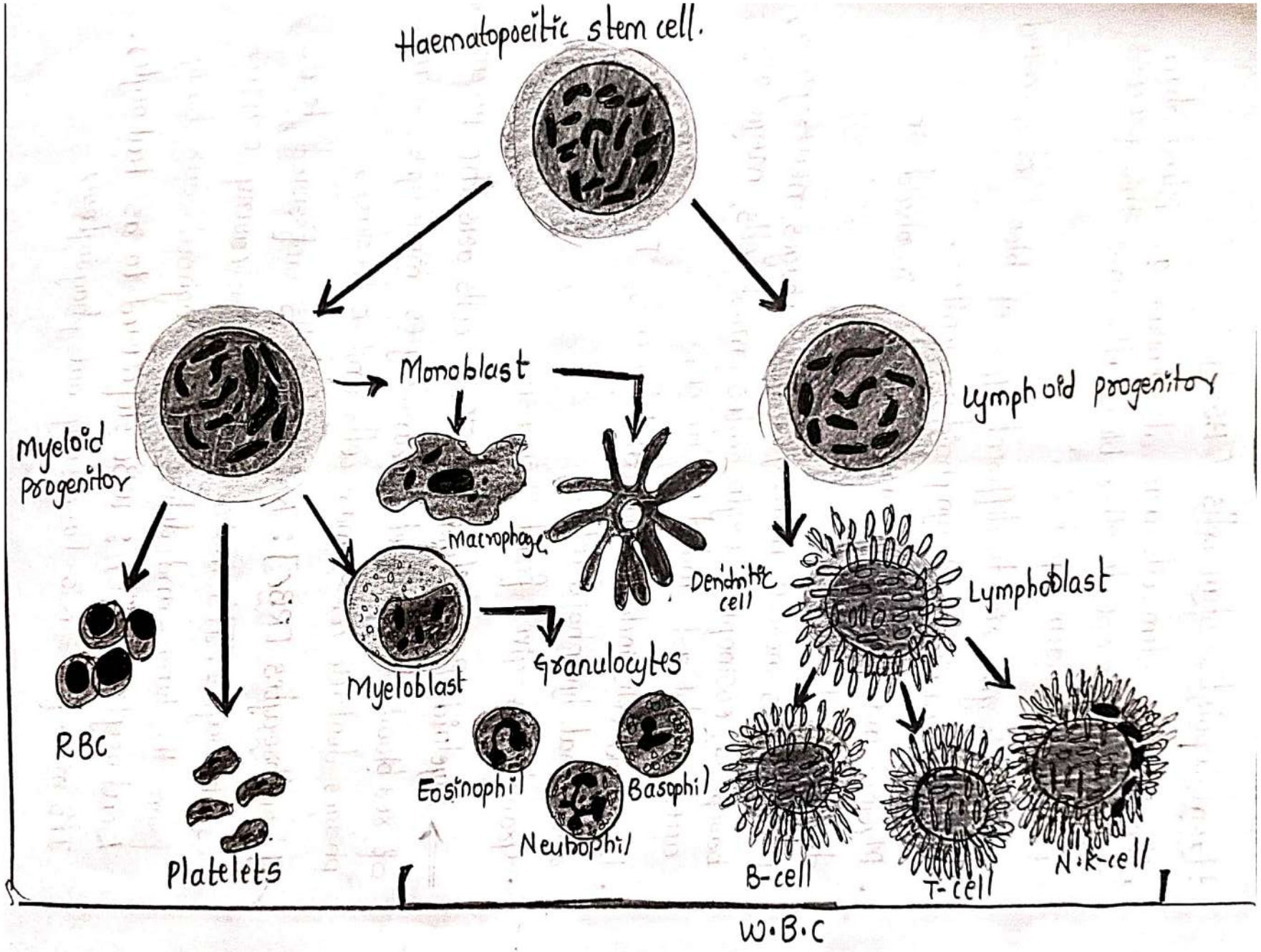
No. of students submitted : 50

G. Chandrakala

HEAD
Department of Microbiology
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda


Haematopoeitic stem cell.
Myeloid progenitor
Monoblast
Macrophage
Lymphoid progenitor
Dendritic cell
Lymphoblast
RBC
Platelets
Myeloblast
Granulocytes
Eosinophil
Basophil
Neutrophil
B-cell
T-cell
N.K-cell
W.B.C

Haematopoietic stem cells [HSCs]

- Haemtopoietic stem cells are also known as Blood stem cells that give rise to other blood cells, and this process is called as Haematopoiesis.
- HSCs cells give rise to different types of blood cells, called Myeloid progenitor and lymphoid progenitor.
- Myeloid and lymphoid lineages both are involved in dendritic cell formation.
- Myeloid cells include monocytes, macrophages, neutrophils, basophils, eosinophils, erythrocytes, mast cells, megakaryocytes, myeloblast and dendritic cell.
- Lymphoid cells include natural killer cells, T cells, B cells and innate lymphoid cells.
- Granulocytes gives first response.

→ Myeloid Progenitor :— These cells are the precursor of red blood cells, platelets, granulocytes, monocyte, macrophages, dendritic cells, mast cells and osteoclasts.

1.] Erythrocytes [RBC] : Red blood cells referred to as Erythrocytes. It's main function is to carry oxygen from the lungs and deliver it throughout our body.

Leukocytes [WBC] : WBC referred to as Leukocytes. It's main function is to carry out phagocytosis.

Granulocytes: A type of immune cell that has granules with enzymes that are released during infections etc.

i.] Neutrophils :-

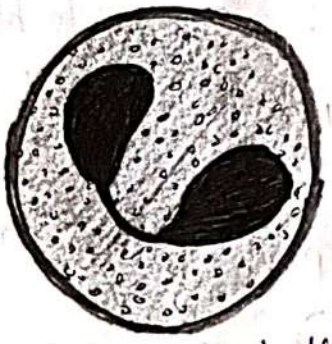
- Neutrophils also known as neutrocytes, heterophils / polymorphonuclear leukocytes are a type of white blood cell.
- They form the most abundant type and make up around 40% to 70% / 80% of all WBCs
- They form an essential part of the Innate immune system.

Neutrophil.

- The average size of Neutrophil is 12 to 15μm can 19μm.
- Neutrophil is likely to first encounter a pathogen.
- Extremely good in phagocytosis.
- It has very short life span compared with other WBCs.
- It forms hair like filaments by joining 2 to 5 lobes.
- It produces puss during an infection.
- It moves like amoeba, hence it has Amoeboid movement.

iii) Eosinophil :-

- It also called as eosinophiles (or) acidophils.
- Eosinophils make up about 1-3% of WBCs, and are about 12 -17 μm in size with bilobed nuclei.



Eosinophil.

- It releases many cytokines and other chemical factors.
- It is important for wound healing and tissue repairing.
- It is less common in the blood than Neutrophil.

iii) Basophil :-

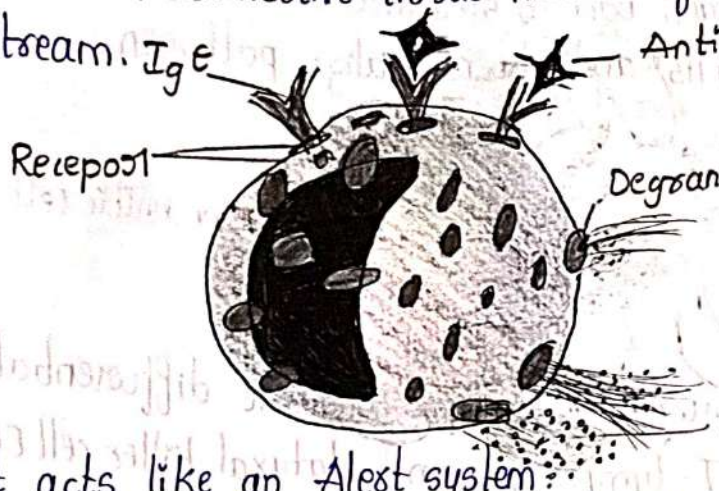
- These cells are least common type of WBC.
- These cells are the largest granulocytes
- It represents about 0.5 - 1%

Basophil.

- It secretes cytokines & other signalling molecules.
- It has S- shaped nuclei with 2 lobes.

IV.] Mast cells :-

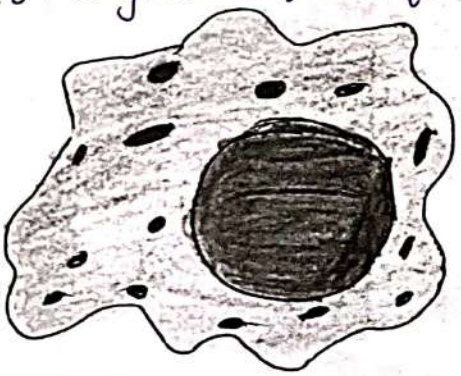
- Mast cells are similar to Basophils.
- But donot have multi-lobed nuclei.
- Found in connective tissue instead of circulating in blood stream.



- It acts like an Alert system.
- It contains large secretory granules of Heparin, proteoglycon and anti-coagulation [blood thinner chemical]

V.] Macrophages :-

- Releases cytokines to create immune response
- It performs phagocytosis.
- It lives on tissue under normal conditions is known as Tissue radient macrophage.
- These cells originated from foetal yolk sac.



Macrophage.

vi] Dendritic cell :-

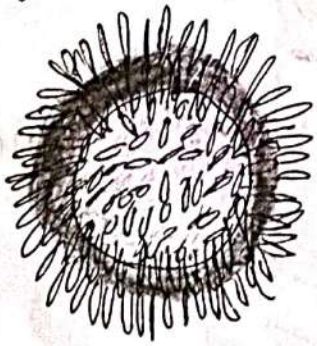
- These cells have capability to performs phagocytosis.
- It is found in tissue.
- It is not heavily involved in pathogen clearance.
- It can take antigen back to structure called lymphnode and activates T cells and also neutralize pathogen.

Dendritic cell.

⟹ Lymphoid Progenitor :- These cells are differentiated into B lymphocyte, T-lymphocyte and Natural killer cell [NK]

i] B-lymphocytes/ B-cells :-

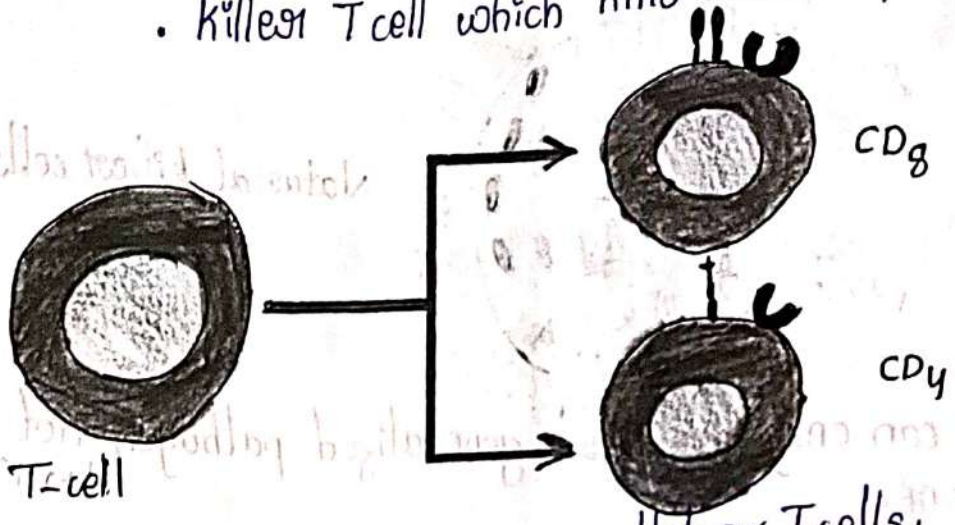
- Its main role is to make antibody 'Y' shaped protein that can bind to pathogen's.
- It blocks pathogen from entering and phagocytosis.
- It requires help from T-cells to became fully activated.
- It is a life long production process starts in foetal & bone marrow after birth.
- It is a key player in adaptive IR.



B-cells.

ii.] T-lymphocytes/ T-cells:-

- CD_8 : . These are the surface proteins by dividing into CD_4 and CD_4 (cluster of differentiation). These are expressed surface of immune cell.
  . Killer T cell which kills cancerous/infected cells.

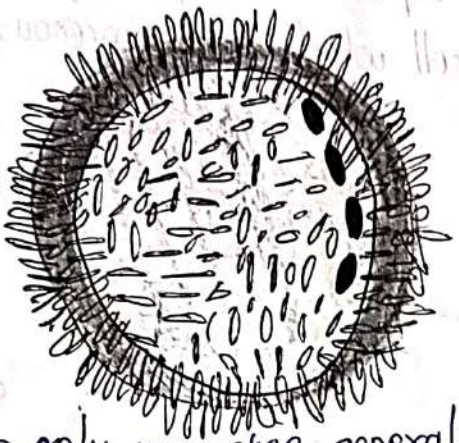


- CD_4 : . These are known as Helper T cells.
  . These activate B-cells and secrete cytokine.
  . It guides immune response.

- Regulating T cells : . Secretes cytokine to tone down IR overly it and kills killer T-cells. , it starts getting out of control.
  . After encountering pathogen, B & T cells can live for years in the body. So, next time they see the pathogen and able to give strong reaction allowing the body to control infection more quickly.

iii] Natural killer cells :-

- It recognizes and kills cancer cells and virally infected cells.
- These are effective in identifying and clearing pathogen.



Natural killer cells

- But they can only recognise generalized pathogen not specific one.
- They can differentiate good & bad microbe.
- Nk cells develops in Bone marrow as well as some extra modular sites such as lymph nodes.
  ex: Thymus, liver etc.

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2023-2024 - I year

Student Assignment

Name of the department:- Microbiology

class : BSc (Microbiology) - I sem

No. of students : 75

Name of the Topic : classification of Carbohydrates

No. of students submitted : 72

G. Chandrakala
HEAD
Department of Microbiology
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE HANAMKONDA

A.

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

ASSIGNMENT

NAME :- T. HARINI

CLASS MIZCS IInd-SEM

TOPIC : BIOMOLECULES
CARBOHYDRATES

Sd.

A.

VAAGDEVI DEGREE & P.G. COLLEGE
HANAMKONDA

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

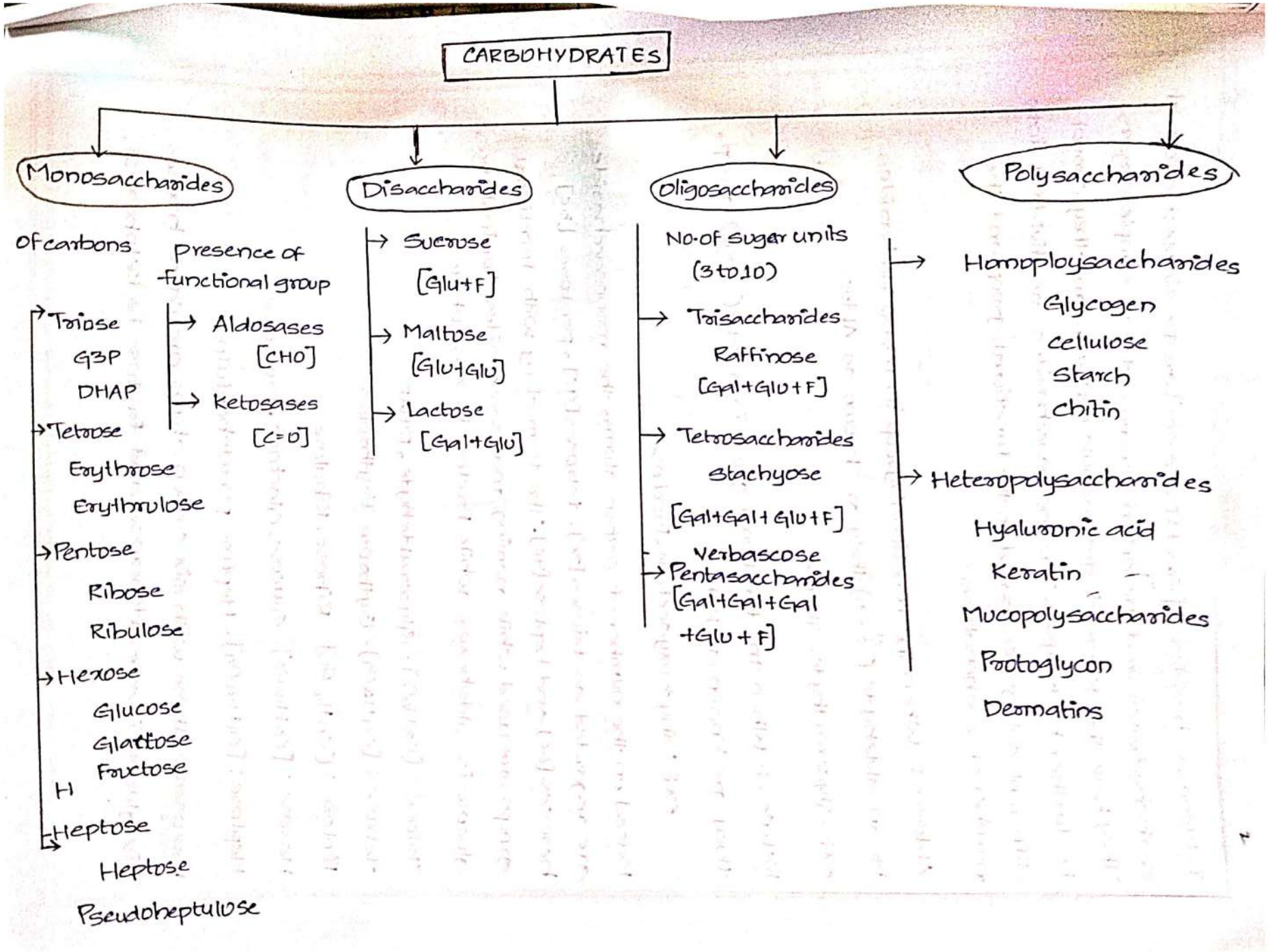
BIOMOLECULES

CARBOHYDRATES

Carbohydrates are defined as polyhydroxy aldehydes [or] ketones [or] compounds that produce them on hydrolysis. They have a general formula of $C_n(H_2O)_n$. These definition of a carbohydrates was proposed by Emil fisches, who is also regrated as father of Shremral Biochemistry

*IMPORTANCE:-

Carbohydrates play a major role in promoting the health fitness. They form a major part of food and help a great deal in building the body strength by generating energy. In fact, they are one among the three prominent macronutrients that serve as excellent energy provides. The functions of carbohydrates are multiple and it is owing to this fact that if becomes all the more necessary to incorporate carbohydrates in the meal. For instant energy generation, sugars and starch act as the perfect fuel that enable to carry out physical activies efficiently and effectively fiber does wonders in keeping bowel function going smooth, being fats and proteins. carbohydrates intake can take place in different fooms like sugar, starch, fibers, etc. Talking about the importance of carbohydrates apart from its direct benefits, there is also


CARBOHYDRATES
Monosaccharides
Disaccharides
Oligosaccharides
Polysaccharides
Of carbons
Presence of functional group
Triose
G3P
DHAP
Aldosases [CHO]
Ketosases [C=O]
Tetrose
Erythrose
Erythrulose
Pentose
Ribose
Ribulose
Hexose
Glucose
Glactose
Fructose
Heptose
Heptose
Pseudoheptulose
Sucrose [Glu+F]
Maltose [Glu+Glu]
Lactose [Gal+Glu]
No. of sugar units (3 to 10)
Trisaccharides
Raffinose [Gal+Glu+F]
Tetrosaccharides
Stachyose [Gal+Gal+Glu+F]
Verbascose
Pentasaccharides [Gal+Gal+Gal+Glu+F]
Homoploysaccharides
Glycogen
cellulose
Starch
chitin
Heteropolysaccharides
Hyaluronic acid
Keratin
Mucopolysaccharides
Prototglycon
Dermatins

an added advantage of carbohydrate consumption in different foods, which if eaten, also pave way for consuming other essential nutrients. Therefore, it is preferable to go in for distintive carbohydrates food sources.

Carbohydrates add on to the taste and appearance of food item, thus making the dish tempting and mouth watering. They are sometimes used as flavours and sweetness, Carbohydrates and in regulating blood glucose and also do good to the body by breaking down fatty acids, thus preventing ketones. So eat, plently of foods that are rich sources of carbohydrates, but it is recommended to go in for natural slow digesting carbohydrates

* CLASSIFICATION

Carbohydrates are often refered to as saccharides (Greek: sakcharon-sugar). They are broadly classified into three major groups.

Monosaccharides, oligosaccharides, polysaccharides.

Thes categeorization is based on the number of sugar units. Mono-and oligo saccharides are sweet to taste, crystalline in character and soluble in water, hence they are commonly known as sugars.

I. Monosaccharides :- [Greek: Mono-one] are the simplest group of carbohydrates and are often referred to as simple sugars. They have the general forms formula $(CH_2O)_n$ and they cannot be further hydrolysed. The monosaccharides are divided into different categories, based on the functional group and the number of carbon atoms.

Aldoses :- When the functional group in monosaccharides is an aldehyde ($-\overset{H}{C}=O$) they are known as Aldoses

ex:- Glyceraldhyde, Glucose

Ketoses :- When the functional group is a keto ($-\overset{|}{C}=O$) group, they are known as Ketoses

ex:- Dihydroxyacetone, Fructose

Based on the number of carbon atoms, the monosaccharides are regarded as trioses [3C], tetroses [4C], pentoses [5C] hexoses [6C] and heptose [7C]. The term along with functional groups are used while naming monosaccharides. For instance, glucose is aldohexose while Fructose is a ketohexose.

Triose : $[C_3H_6O_6]$ - Glyceraldehyde, DHAP

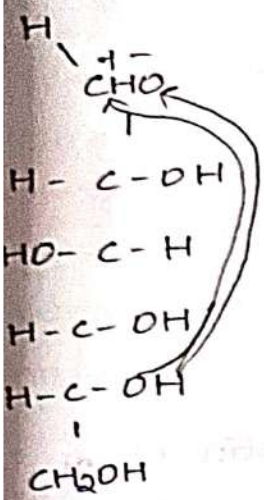
Tetrose : $[C_4H_8O_4]$ - Erythrose, Erythrulose

Pentose : $[C_5H_{10}O_5]$ - Ribose, Ribulose

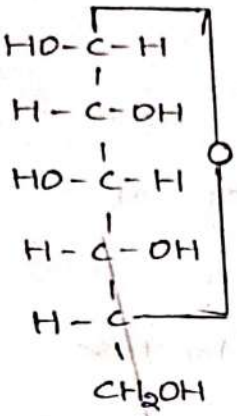
Hexose : $[C_6H_{12}O_6]$ - Glucose, Glactose, Fructose

Heptose : $[C_7H_{14}O_7]$ - Heptose, Pseudoheptulose

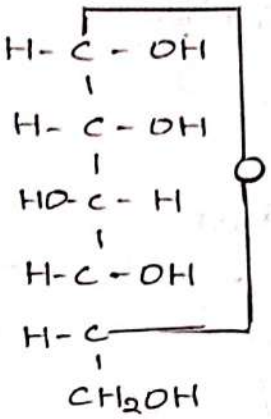
Hexoses :- Those with six carbon atoms are called hexoses viz glucose is an aldohexose and fructose is ketohexose.



Glucose [Openchain]

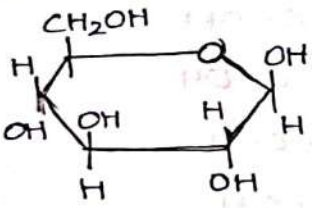


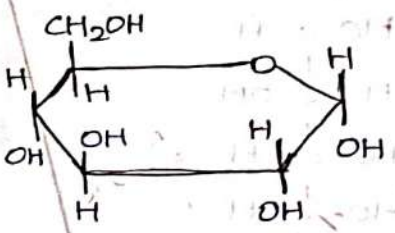
β-D-Glucose



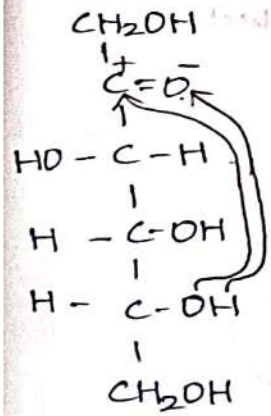
α-D-Glucose

Haworth projection

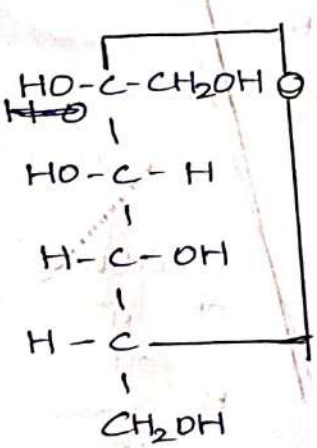




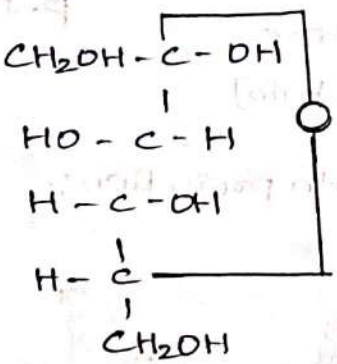
Glucose is the most readily metabolized sugar present in human body. It is sugar fuel of life



Fructose [Open chain]



β-D-Fructose



α-D-Fructose

2023-2024 - I year.

Student Assignment

Name of the department: Microbiology

class: Bsc (microbiology) - I sem

No. of students: 75

Name of the topic: Isolation, purification of Microorganisms.

No. of students submitted: 73

G. Chandrakala.

HEAD
Department of Microbiology
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

VAAGDEVI DEGREE & P.G. COLLEGE

A. Sudhakar Rao

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Shaziya naaz
group :- NDMIC
H.T NO :- 086254501

MICROBIOLOGY

ASSIGNMENT

G. chandrakala

A. [illegible]

Principal
VAAGDEVI DEGREE & P.G. COLLEGE
Kishanpura, Hanamkonda.

Isolation purification and culture of microorganism:-

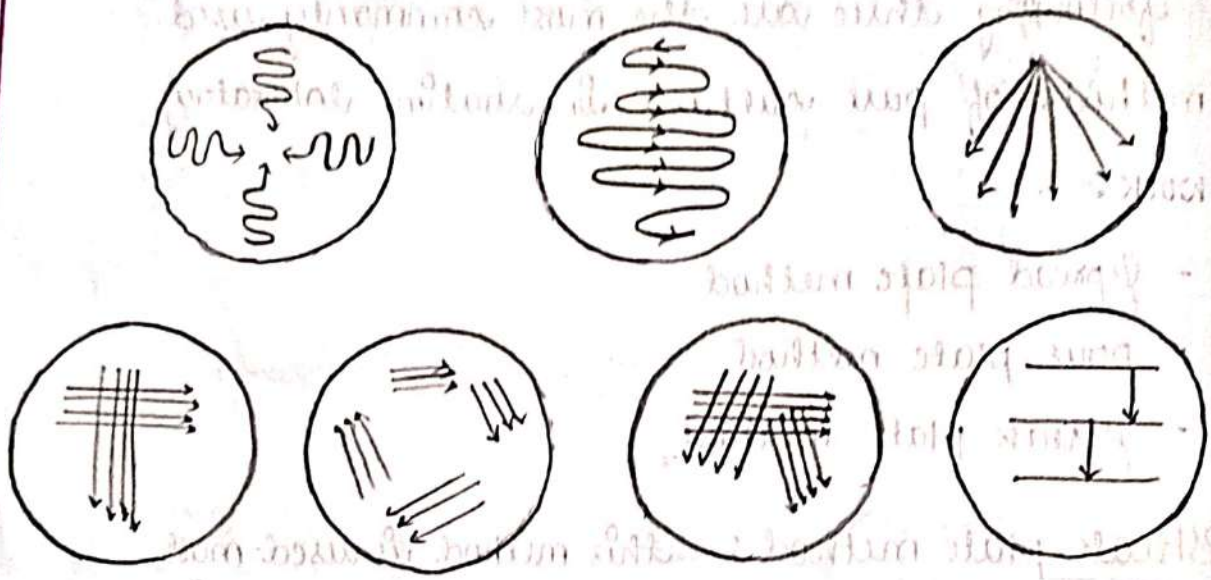
→ A pure culture is defined as a population containing only single species (or) strain of bacteria

following three are the most commonly used methods of pure cultures in routine laboratory work :-

- Spread plate method
- pour plate method
- Streak plate method

Streak plate method :- this method is used most commonly to isolate pure cultures of bacteria. a small amount of mixed culture is placed on the tip of an inoculation loop/needle & is streak across the surface of the agar medium. these plates are incubated to allow the growth of colonies by streaking, a dilution gradient is established across the face of the petri plate as bacterial cells are deposited on the agar sugar surface. each colony is the progency of singal microbial cell thus representing a clone of pure culture.

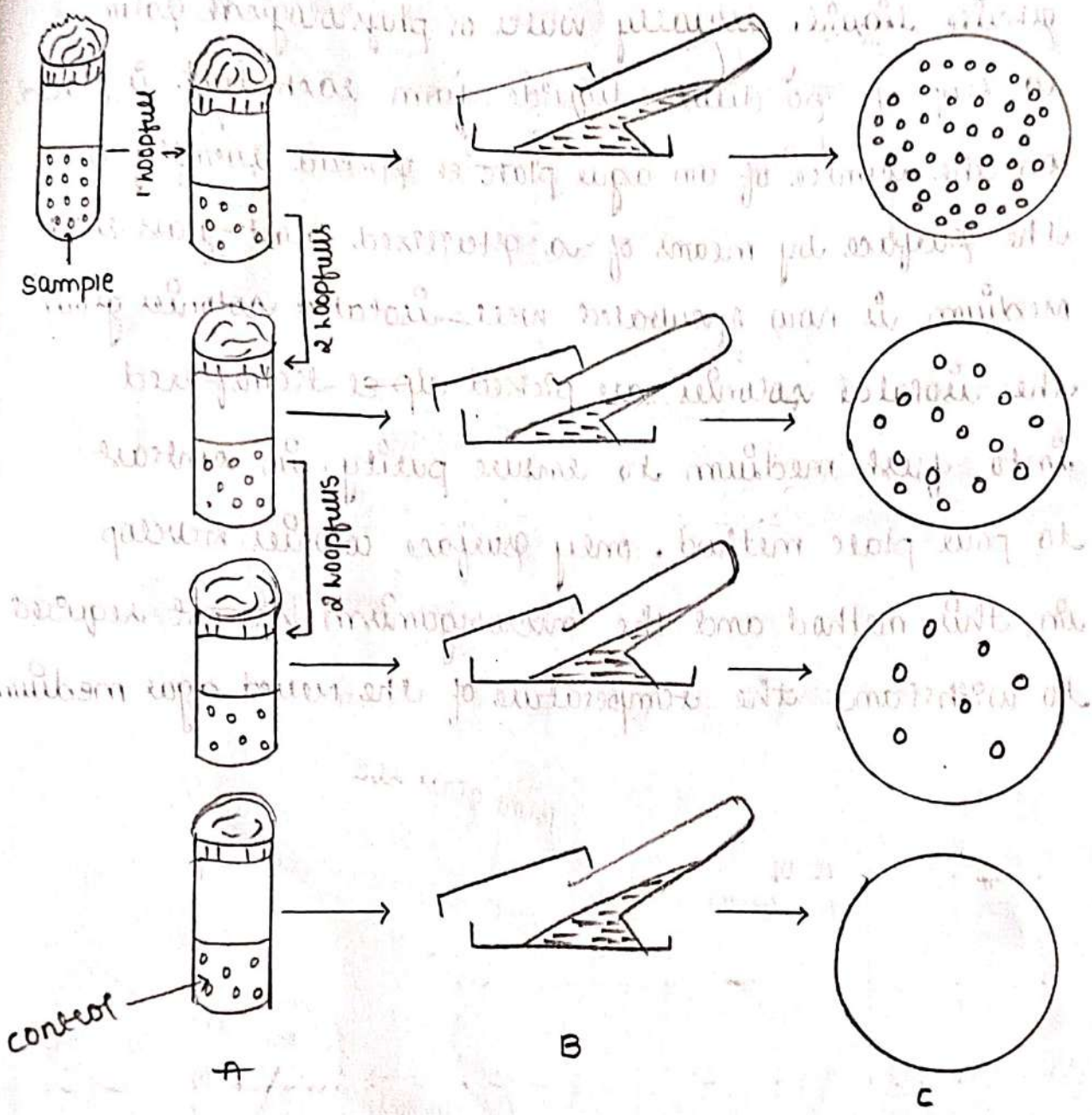
such isolated colonies are picked up separately using sterile inoculating loop/needle and restreaked into fresh media to ensure purity.



pour plate method :-

this method involves plating of diluted samples mixed with melted agar medium the main principle is to dilute the inoculum in successive tubes containing liquified agar medium so as to permit a thorough distribution of bacterial cells within the medium, mixed culture of bacteria is diluted directly in tubes at temperature of 42-45°c agar solidified below 42°c bacteria and the melted medium

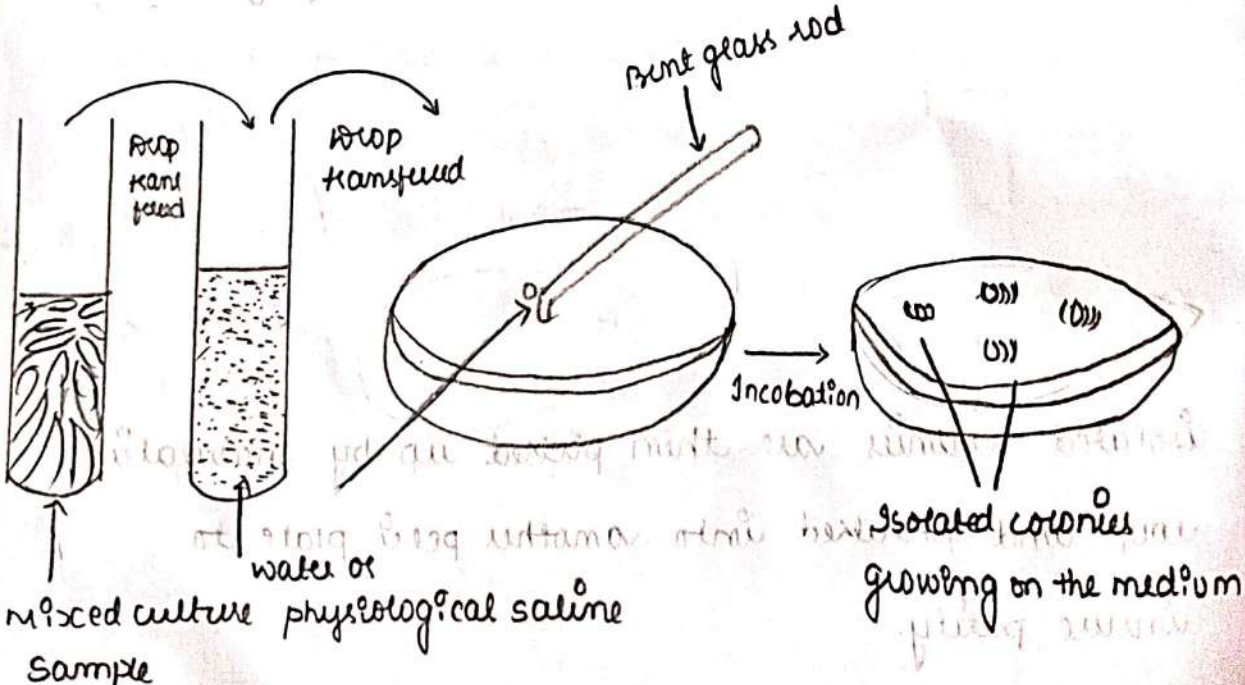
are mixed well contents of each tube are poured into separate petri plates, allowed to solidify and then incubated when bacterial colonies develop.



isolated colonies are then picked up by inoculation loop and streaked into another petri plate to insure purity.

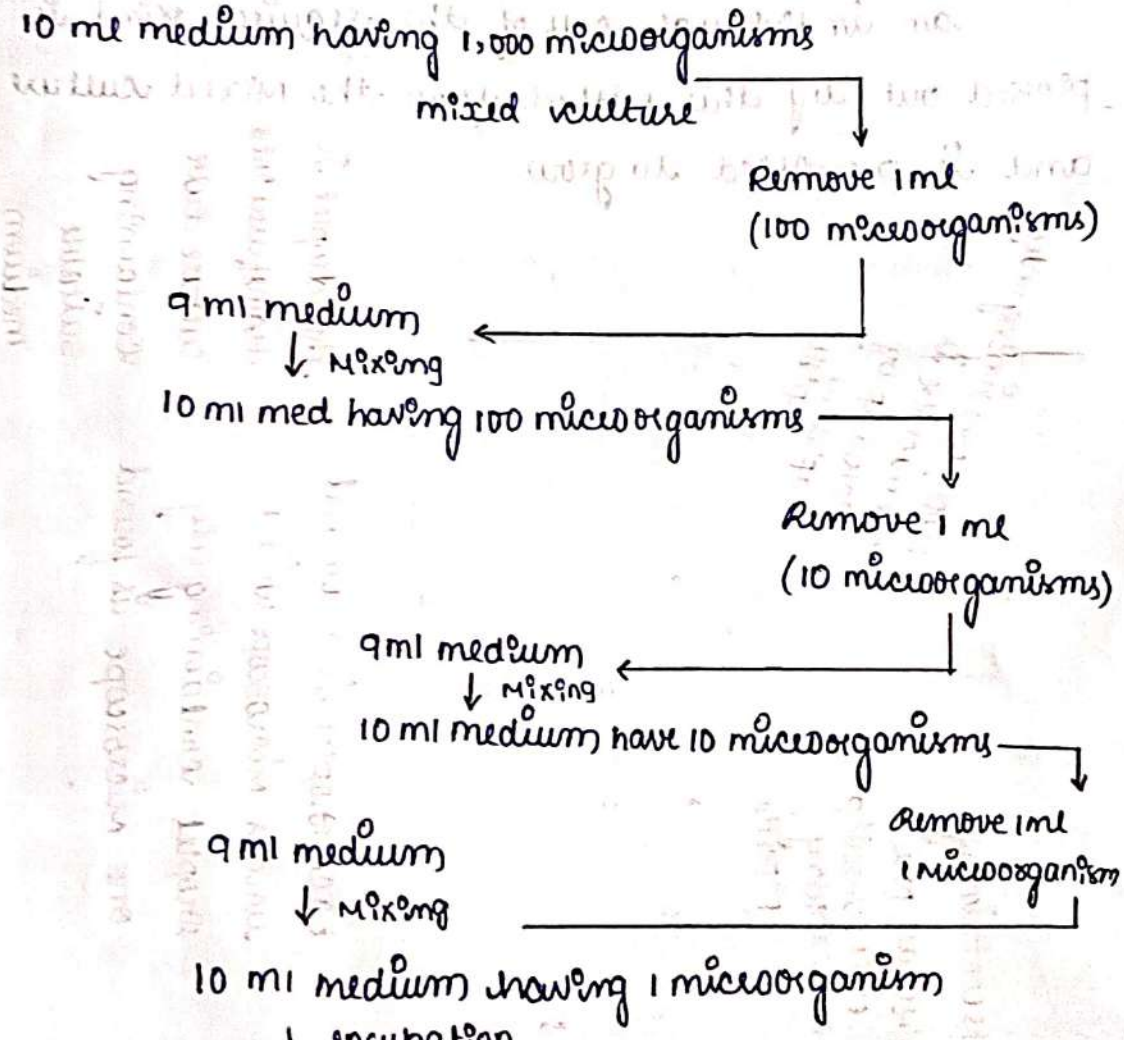
Spread plate method :-

In this method the mixed culture of a microorganism diluted in a series of tube containing sterile liquid, usually water or physiological saline a drop of so dilute liquide from each tube is placed on the centre of an agar plate & spread evenly over the surface by means of a sterilized bent-glass rod Medium is now incubated well-isolated colonies grow the isolated colonies are picked up & transferred into fresh medium to ensure purity. In contrast to pour plate method, only surface colonies develop in this method and the microorganism are not required to withstand the temperature of the melted agar medium.



Serial dilution method :-

this method is commonly used to obtain pure cultures of those microorganism that have not yet been sucessfully cultivated on solid media and grow only in liquid media. a microorganism that predominates in a mixed culture can be isolated in pure form by a series of dilutions.



the medium now containing millions of microorganism but, since, they all orginated from single microorganism, its pure culture.

VAAGDEVI DEGREE AND PG COLLEGE

(An Autonomous Institution, Affiliated to Kakatiya University.)

Kishanpura, Hanamkonda

Department of Physics and Electronics
Students Assignment

S. No.	Group	SEM	Assignment Topic
1	MPCs Sec - A & MPCs Sec - B	I	Vectors, Scalars, Vector field, Scalar field, Curl of a vector field, Gradient, Divergence
2	MPCs Sec - A & MPCs Sec - B	I	Gauss Divegence theorem, Stokes theorem
3	MPCs Sec - A & MPCs Sec - B	I	Variable mass system, Motion of a Rocket, Euler's equations, Symmetrical Top
4	MPCs Sec - A & MPCs Sec - B	I	Equation of motion of a particle under cetral force, Kepler's lws
5	MPCs Sec - A & MPCs Sec - B	I	Michelson - Morley Expeeriment, Loretnz transformations
6	MECs	I	Average, rms value of current, J - operator, Kiechchoff's law and its applications
7	MECs	I	Maximum power transfer theorem, Thevinin's theorem, Norton's theorem
8	MECs	I	Transient response of CR & LR circuits, Diffentiator & Integrator
9	MECs	I	LCR series and parallel circuits, Construction and working of CRO
10	MPCs Sec - A & MPCs Sec - B	II	Maxwell - Boltzmann's velocity distribution law, Transport phenomenon
11	MPCs Sec - A & MPCs Sec - B	II	Thermodynamical potentials, Maxwell's equations
12	MPCs Sec - A & MPCs Sec - B	II	Planck's law, Rayleigh Jeans law, Weins law
13	MPCs Sec - A & MPCs Sec - B	II	Maxwell-Boltzmann distribution law, Bose - Eienstein law, Fermi - Dirac distribution law
14	MECs	II	Formation of PN diode, zenor diode, V-I Characteristics
15	MECs	II	PNP, NPN transistors,

16	MECs	II	Transitor configurations, V - I characteristics
17	MECs	II	Construction and working of FET , V-I charatoristics, FET as switch
18	MECs	II	Construction and working of UJT, UJT as relaxation oscillator
19	MECs	II	Construction and working of SCR, Characterisitics
20	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	III	Gauss's law , application to spherical charge distributions, Electrical potential from electric field for a spherical charge distribution.
21	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	III	Biot-Savart's law, 'B' due to a straight current carrying conductor, Ballistic Galvanometer
22	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	III	Maxwell's equations in vacuum and dielectric medium, Poyinting's theorem.
23	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	III	Growth and decay of currents in LR, CR and LCR circuits
24	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	III	Thevenin's theorem, Norton's theorem. Reciprocity theorem and Maximum power transfer theorem
25	MECs	III	Full wave rectifier, Bridge rectifier
26	MECs	III	L-Section filter, π- Section filter
27	MECs	III	Switch mode power supply, UPS
28	MECs	III	Feedback, advntages of negative feedback, RC coupled amplifier
29	MECs	III	Colpitt's oscillator, Hartley Oscillator, Phase shift Oscillator,Wein bridge oscillator
30	MECs	III	Astable multivibrator, Monostable multivibrator, Bistable multivibrator
31	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	IV	Transverse wave propagation along a stretched string, modes of vibration of stretched string clamped at ends,
32	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	IV	Longitudinal vibrations in bars- wave equation and bar fixed at both ends

33	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	IV	Newton's rings, Michelson Interferometer
34	MPCs Sec - A,MPCs Sec - B & MPCs Sec - C	IV	Fraunhofer diffraction due to single slit, double slit
35	MPCs Sec - A, MPCs Sec - B & MPCs Sec - C	IV	Babinet's compensator – Optical activity, analysis of light by Laurent's half shade polarimeter.
36	MECs	IV	Inverting Op-Amp, Non-inverting Op-Amp, integrator and differentiator
37	MECs	IV	Sine wave (Wien Bridge) generator and square wave (Astable) generator, Triangular wave generator, Monostable multivibrator
38	MECs	IV	Amplitude modulation, Balanced modulator, Demodulation – diode detector
39	MECs	IV	Frequency modulator, FM Discriminator, Advantages of frequency modulation
40	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	V	Vector atom model, Raman effect. Experimental arrangement
41	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	V	Davisson and Germer experiment, Schrodinger time independent and time dependent wave equations
42	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	V	Gammow's theory of alpha decay.GM counter
43	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	V	Bragg's law, Experimental techniques - Laue's method and powder method.
44	MECs	V	OR, AND, NOT, XOR, NAND, NOR gates and their truth tables half adder, full adder
45	MECs	V	De Morgan's Theorems, Reduction of Boolean expressions using Karnaugh Maps
46	MECs	V	Flip-flops: SR, D, JK, T, JK and JK Master-Slave, SISO, SIPO, PISO and PIPO registers
47	MECs	V	Architecture of 8085 microprocessor

48	MPCs Sec - A,MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	VI	Full wave rectifier, Bridge rectifier
49	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	VI	PNP, NPN transistors, RC coupled amplifier
50	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	VI	Construction and working of FET , V-I charatoristics, FET as switch, Construction and working of UJT, UJT as relaxation oscillator
51	MPCs Sec - A, MPCs Sec - B, MPCs Sec - C & MPCs Sec - D	VI	OR, AND, NOT, XOR, NAND, NOR gates and their truth tables half adder, full adder
52	MECs	VI	Architecture and pin diagram of 8051,
53	MECs	VI	Addressing modes: Immediate, Register, Direct, Indirect, Absolute addressing, Relative addressing, Indexed Addressing
54	MECs	VI	Addition, Subtraction, division, picking the smallest/largest number among a given set of numbers,
55	MECs	VI	Interfacing of DAC 0808 to microcontroller, Interfacing of ADC 0804 to microcontroller, Seven segment LED.

PHYSICS ASSIGNMENT - I

Name: Ponnala Praveen sub:- physics group:- mpcs(A) I

Sem - I

Vector Analysis

→ vector analysis is used to simplify same physical quantities like mechanics electro dynamics, fluid dynamics etc...,

Vector:- The physical quantity which as magnitude, and direction is called as vector

Ex:- displacement, velocity, force.

Scalar:- The physical quanity which as only magnitude is known as scalar.

Ex:- Temperature, mass, density...

Vector field:

When a physics quantity express point to point in orgin of space is called as vector field

Ex:- Magnetic field, electric field, gravitational field.

Scalar field:- When a physical quantites magnitude express point to point in a region of space. is called as scalar field.

ASSIGNMENT - 05

G. Pavan Sai kumar
MPCS Roll: 43

Sem - 1

CENTRAL FORCES

* Central force is defined As a force which acted on a Particle or object is towards or away from a fixed Point.

Ex: gravitational force

Let us Consider two objects having mass $m_1 m_2$ one object is revolving around other object then the central force is [gravitational force]

$$f = -\frac{G m_1 m_2}{r^2}$$

Here

G = Gravitational force constant.

Ex: Electrostatic force.

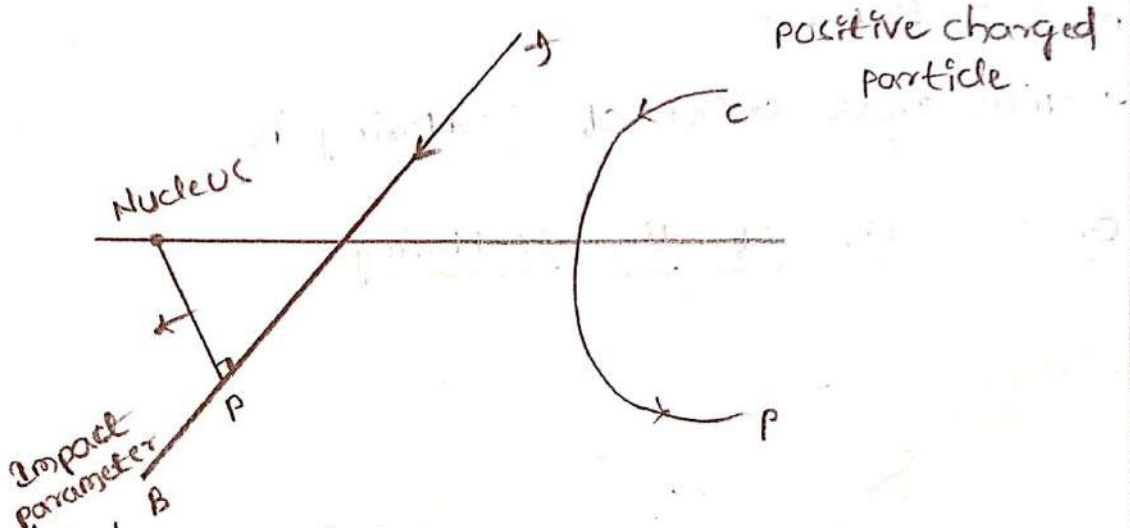
If we considerd on electron the electron is revolving around nucleus In a orbital the force experienced by the electron is a central force and is given by

$$F = \frac{1}{4\pi E_0} \frac{q_1 q_2}{r^2}$$

Name :- Y. Karnakar Sub :- physics
group :- MPC(I(A)) Roll No :- 53.

Sem - IV

Impact parameters :-



The closed approach between a position charged particle and the nucleus when the charged particle approaching towards the nucleus it is called Impact parameters.

Explaination of Impact Parameter

=) Let us consider nucleus 'n' and a' position charged particle at the position 'a' which is passing at the site of nucleus its actual path is to D. In parabolic path because there will be columboic repulsion takes place between the nucleus and charged particle but if this force is neglected the charged particle will go along the path APB in the straight line the distance between n and P is a closed distance between the nucleus and the particle. These is

Physics Assignment - III

Group: MPCS
Section: A
Sem - I

TOPICS

1. Stokes theorem
2. Gauss divergence theorem
3. Newton's laws of motion

⇒ **Stokes theorem** : Line integral of a vector field in closed surface is equal to the normal surface integral of a curl of a vector field Bounded by a curl.

⇒ If A is a vector field

$$\int A\,dl = \iint (\nabla \times A)\,ds.$$

⇒ By using stokes theorem we can convert line integral into surface integral.

PROOF :

Let us consider a surface 'S' Bounded by curl 'C'. The surface 'S' is divided by 'n' no. of surfaces $ds_1, ds_2, ds_3 \ldots ds_n$

These are bounded by curves $C_1, C_2, C_3 \ldots C_n$.

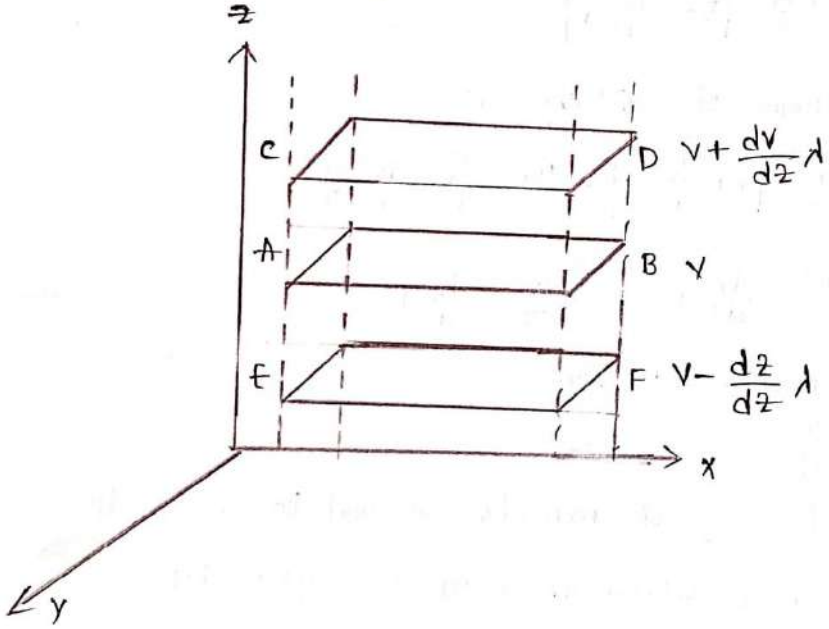
⇒ By the definition of a curl of a vector field is the maximum line integral of a vector field.

Name : Mohan Sai
class : Bsc. MPC's
Roll No : 08624-4213

ASSIGNMENT Sem - II

TRANSPORT PHENOMENON

⇒ VISCOSITY



* In a gaseous system the different layers may be have different velocities this will result in the relative motion of different layers with respect to each other in such a case the layer moving faster will transform momentum to the slowly moving layer. Thus the transport of momentum gives the phenomenon of viscosity.
* Let us consider 3 layers of a gaseous system. The AB layer has velocity v if velocity gradiant $\frac{dv}{dz}$

1) What is an electric field & derive the electric field equation for a charged sphere when point lies

a) inside the sphere

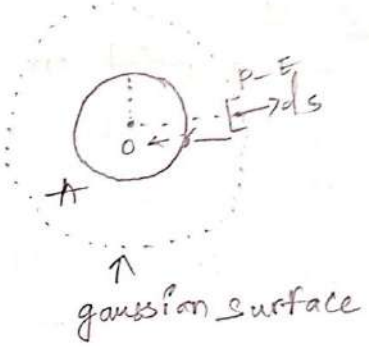
b) over the sphere

c) outside the sphere

A] At a point outside the charged sphere

Consider a sphere of radius 'R' with centre 'O' as shown in fig

Let a charge 'q' uniformly distributed over it.



Suppose 'P' be the external point at a distance 'r' from the centre 'O' of the sphere.

We shall find the electric field at this point. For this purpose we construct a Gaussian surface.

From the symmetry of charge distribution the electric field at 'R' point of the Gaussian surface is the same field at 'R' point. and it will be ⊥ to the surface

∴ E is directed along the outward is normal

For a small Gaussian surface ds is also directed outwards.

$$\therefore \phi_E = \int E \cdot ds \cos 0 = \int E \cdot ds$$

$$\phi_E = \int E \cdot ds$$

$$\phi_E = E \int ds$$

$$\phi_E = E (4\pi r^2) \quad \text{---} (1)$$

According to Gauss law

$$\phi_E = q/\varepsilon_0 \quad \text{---} (2)$$

Name: P. Siddu
Roll No: 08624154
Group: MPCS-2nd sem
Subject: physics

Sem-II

It describes the distribution of distinguishable particles of a system into different energy levels, let us consider a system of 'N' particles assume that there are 'ni' particles are occupying 'ei' energy level whose degeneracy is 'gi'

$N = n_1 + n_2 + n_3 + \dots \sum_{i=1}^{i=0} n_i = \text{constant} \rightarrow (1)$

$E = n_1E_1 + n_2E_2 + n_3E_3 + \dots \sum_{i=1}^{i=\infty} n_iE_i = \text{constant} \rightarrow (2)$

According to thermodynamics probablity of this system (weight) $w = g_i^{n_i}$

According to statistical mechanics entropy of a system is given by

$$S = k \log w = \log g_i^{n_i} = k n_i \log g_i \rightarrow (3)$$

Differentiating and adding above the three equations

$$dw + dE + d(k n_i \log g_i) = 0$$

By solving these equations $n_i = \frac{g_i}{e^{\alpha + \beta E_i}} \rightarrow (4)$

where $\alpha = \frac{\mu}{KT}$, $\beta = \frac{1}{KT}$, $g_i = \frac{4\pi V p^2}{h^3} dp$

The maxwell Boltzmann distribution law is applicable for liquid and gaseous system only

Maxwell-Boltzmann velocity distribution law:

According to maxwell-Boltzmann, the molecules of a system may have the velocity range from 0 to ∞ By using maxwell's Boltzmann distribution law, the average number of gaseous molecules which are having the velocity from v to v+dv

According to MB distribution law,

Y. Hasini, MPC - B, Sem - IV

1. What is Transverse Impedance and Derive equation for it.

When a wave is transported in the string then opposite force which is acting against the transportation of wave known as Transverse Impedance. It is represented by 'z'.
It is also defined as ratio between transverse force to transverse velocity.

$$Z = \frac{\text{transverse force}}{\text{transverse velocity}} = \frac{(-f)}{v}.$$

Consider a 'l' length of string vibrating with transverse force.

$f = f_0 \cos\omega t$ and the force which is acting downward direction is $-T\sin\theta$.

These two forces are equal to each other.

$$f = f_0 \cos\omega t = -T\sin\theta.$$

$$f = -T\tan\theta$$

$$f = -T\left(\frac{dy}{dx}\right)_{x=0} \quad \text{---(1)}$$

From the solution of Transverse wave.

$$y = A\sin[k(vt - x)]$$

$$k = \frac{2\pi}{\lambda}$$

$$y = A\sin\left[\frac{2\pi}{\lambda}(vt - x)\right] \quad \text{---(2)}$$

By diff w.r.t 'x'

$$\left(\frac{dy}{dx}\right) = A\cos\left[\frac{2\pi}{\lambda}(vt - x)\right]\left[-\frac{2\pi}{\lambda}\right]$$

$$\left(\frac{dy}{dx}\right)_{x=0} = -A\left(\frac{2\pi}{\lambda}\right)\cos\left[\frac{2\pi}{\lambda}(vt)\right] \quad \text{---(3)}$$

By diff eq(2) w.r.t 't'

$$\frac{dy}{dx} = A\cos\left[\frac{2\pi}{\lambda}(vt - x)\right]\left[\frac{2\pi}{\lambda}v\right].$$

-AJAY
08622447B.
PHYSICS
-ASSIGNMENT-1.
Sem-V

1) Describe the postulates of vector atom model and write above the associated Quantum numbers.

* The Bohr and sommerfield atomic model couldn't explain the following points of the spectra of an atom

* Bohr doesn't explain the atomic spectrum of many electrons

* Both the models do not explain the fine structure of the spectral lines

* Both models do not explain Zeeman stark effect.

* Both models donot explain the distribution and arrangment of electrons in orbit

* They do not explain doublet ~~sep~~spectra of alkali atoms

In order to explain the above difficulties of two postulates were proposed in vector atom model
(i) Space Quantization ii) Electron spin

(i) Space Quantization:- Bohr and sommerfield atomic models describes the motion of electrons around the nucleus only in orbit but these theory do not explain the orientation of an orbit in three dimension space.

→ In presence of an external magnetic field the angular momentum vector ($\vec{p}$) of an electron makes a precession light motion about the applied field direction

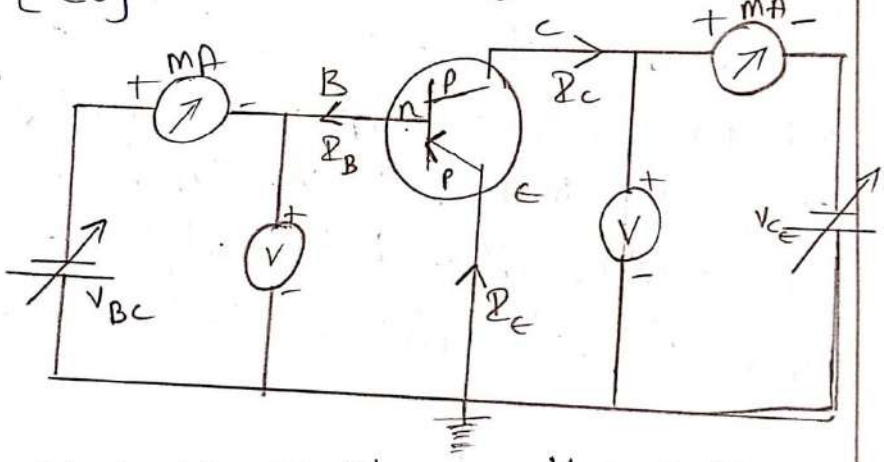
NAME: S: ARUN Group: MPCS H.T.NO: 0862245461
VI-SEM- Sub: physics.

1 Common Emitter configuration

→ In common Emitter configuration base is Input and collector is output and Emitter is common to the both base and collector.

*Input characteristics:-

→ It is the curve Draw between Base current [I_B] and Base Emitter [V_{BE}] at constant collector Emitter Voltage [V_{CE}] the circuit Diagram shown in. below figure.



→ From the above Diagram we observe the C-E P-n-P transistor to observe base current [I_B] one mille Ammeter [V_{BE}] is connected between base and ~~Emitter~~] volt meter [V_{BE}] is connected between base and Emitter terminals to measure base Emitter Voltage.

→ To observe collector current [I_C] at the output one another milli ammeter is connected and for collector Emitter voltage [V_{CE}] one vat meter

L. Geethanjali 08622-24445
MPCS-A - VI SEM

Transistor :-

n-p-n Transistor

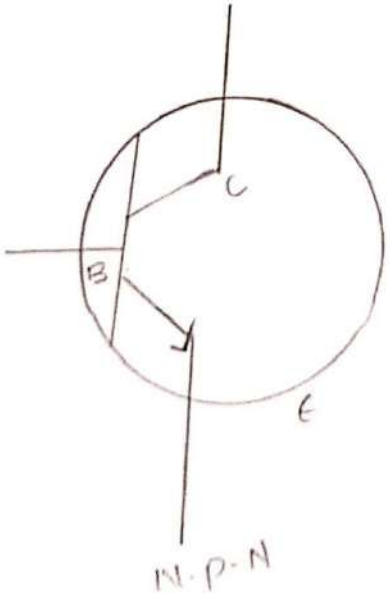
The transistor in which a p-type semiconductor material is placed between two n-type semiconductor material is known as n-p-n Transistor

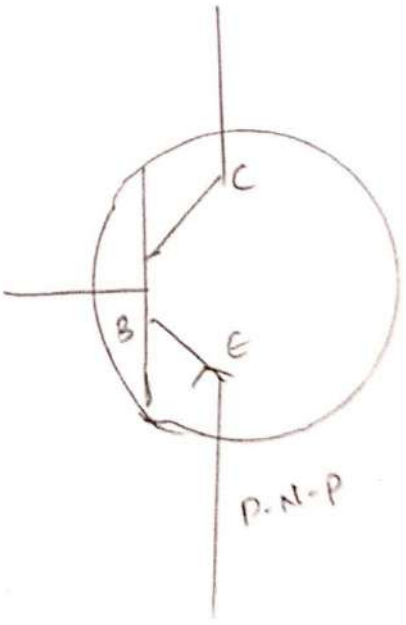
-> In a transistor the 1st segment (n-type) is called emitter and the 3rd large segment (n-type) is called collector while the middle segment (p-type) is called base Hence a transistor can be defined as a three terminal semiconductor device

-> In transistor the current is due to the flow of both majority and minority charge carriers Hence it is also called bipolar junction Transistor.

-> A Transistor can be considered as a combination of 2 p-n Junction diode but it can't be constructed by using 2 diodes.

-> The circuit symbol of transistor is shown in fig





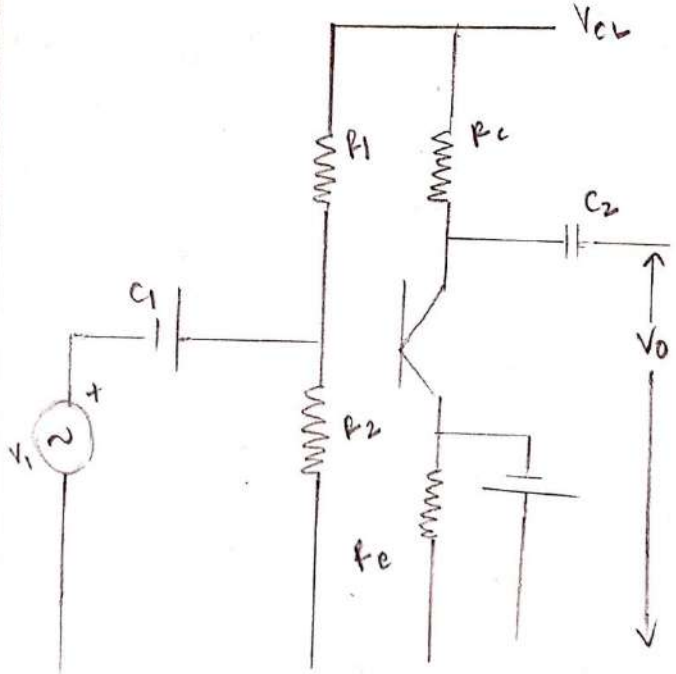
Construction :-

A transistor is a three terminal semiconductor device.

Name: K. Deepthi - MPLS - VI SEM. HT-NO: 08622244235

1. Explain the construction and working of Rc coupled amplifier along with it's frequency response.

When a transistor is used as an amplifier under 'CE' configuration the transistor must act in active region and during the both half cycles of input Ac signal the BE junction must be forward bias. moreover the input voltage should be more than 0.7V for Si. The base emitter junction voltage V_{BE} is temperature dependent. Hence, whenever the temperature of the device changes the amplification of amplifier changes. Hence while designing an amplifier using a transistor, these factors must be addressed. One of the stable biasing circuit as an amplifier called 'Rc' coupled amplifier is shown in figure.



→ In Rc coupled amplifier the stability issues of the device will be minimized by adopting a voltage divider bias circuit. It contains a series combination 2- resistors R_1 & R_2 which provide the required potential.

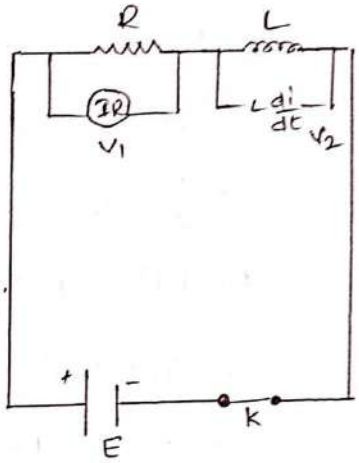
ASSIGNMENT

Roll no:- 02 GROUP:- M.E.Cs. NAME:- RAJESH VILASAGAR Sem - I

Topic :- 1) Growth of current of decay of current in LR circuit
2) LCR parallel circuit

LR- Circuit:-

Growth of current:-



Let us consider an inductor of self inductance 'L' is connected to a DC source 'E' through a resistor of resistence 'R' and key 'k' in series

When the key is switched on the current in the circuit started to increases that the current in the circuit increases, slowly to reach its steady state value.

* Acc to KVL

$$E = V_1 + V_2$$

$$E = IR + L\frac{dI}{dt}$$

$$\frac{1}{E - IR} = L\frac{dI}{dt}$$

$$\frac{1}{EIR}\,dI = \frac{1}{L}\,dt$$

Multiply with '-R' on both sides

$$\frac{-R}{E - IR}\,dI = \frac{-R}{L}\,dt$$

$$\int \frac{f'(x)}{f(x)}\,dx = \log f(x) + C$$

Integrated above eqn

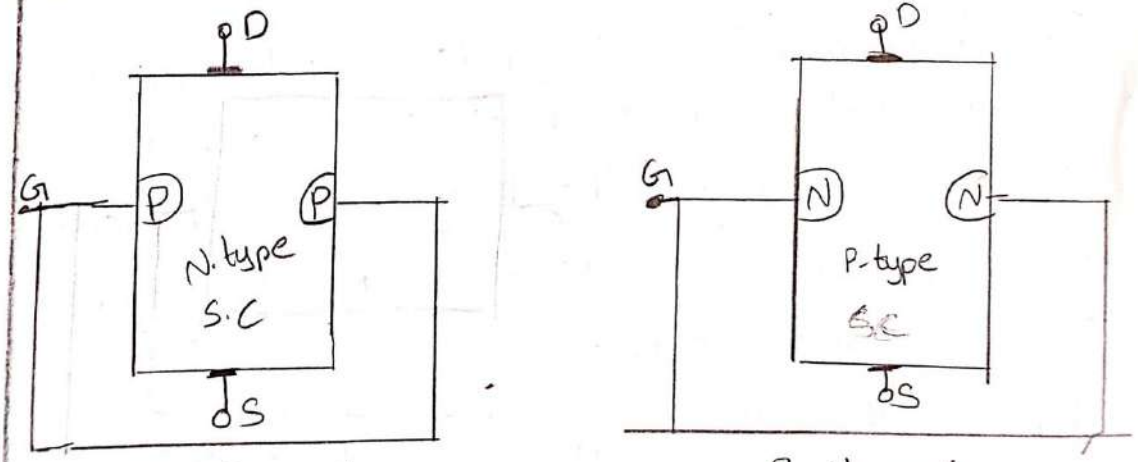
$$\int \frac{-R}{E - IR}\,dI = \frac{-R}{L}\int dt$$

Assignment

Name : B. Ruchitha
Course : MECs
Hall no : L0002
Subject : Electronics
Sem - II

Construct of JFET

FET can be frabicated with N-channel (or) P-channel for construction of N-channel a nenosemiconductor of N-type semiconductor is taken two p-type junctions are diffused on opposite sides these junction form two PN-diodes and threse 2 p-region are interconnected which is called as gate and the constacts made at 2 ends of the bar is called as source and another one is drain.



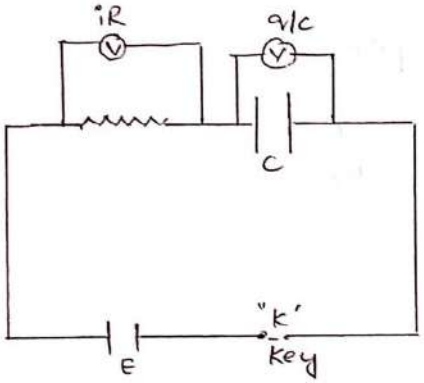
If the bar is of N-type then it is called as "N-channel JFET" and if the bar is the p-type then it is called "P-channel JFET"

TRANSIENT RESPONSE OF RC CIRCUIT

CHARGING OF CAPACITOR

Let us consider a capacitor of capacitance C is connected to dc source 'E' through a resistor of resistance 'R and A key K in series

When the key K is switched on the charging process of capacitor starts the charge on the capacitor increases with time and reaches Maximum in steady duration of time



Acc to KVL

$$\epsilon = iR + q/C \longrightarrow (1)$$

$$iR = \epsilon - \frac{q}{C}$$

$$iR = \frac{C\epsilon - q}{C} \rightarrow (2)$$

$$R\frac{dq}{dt} = \frac{C\epsilon - q}{C} \quad \left(i = \frac{dq}{dt}\right)$$

$$\left[\frac{1}{C\epsilon - q}\right] dq = \frac{1}{RC} dt$$

Integrate above eqn"

ASSIGNMENT

R. Vamshi
B.Sc (MECs) 0862214071
Sem - V

* Design of basic Gates using the universal Gates NAND, NOR?

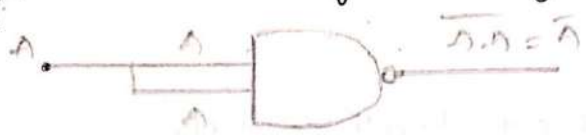
Universal Gates?

* NAND Gate is a universal Gate

=> NAND Gate is known as universal gate because it can be used to realize all the three basis logic function of an OR, AND NOT gate.

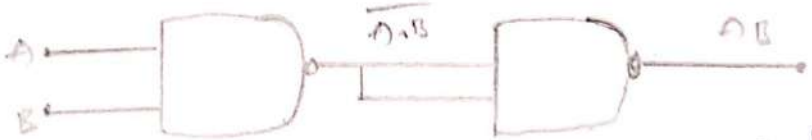
i) NAND as NOT Gate:

=> If the two inputs of NAND gate are connected together then we get 'NOT' gate.



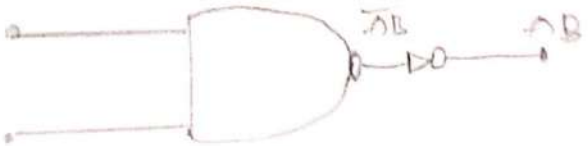
=> If A=B then 'NAND' gate acts as NOT gate.

ii) NAND as AND gate:



(or)

AB Boolean expression for AND.



iii) NAND as OR Gate:

=> OR gate can be made out of the three NAND Gates.

=> If complimented inputs are applied to NAND gates

VAAGDEVI DEGREE AND PG COLLEGE

KISHANPURA, HANAMKONDA

DEPARTMENT OF BIOTECHNOLOGY

STUDENTS ASSIGNMENTS 2023-2024

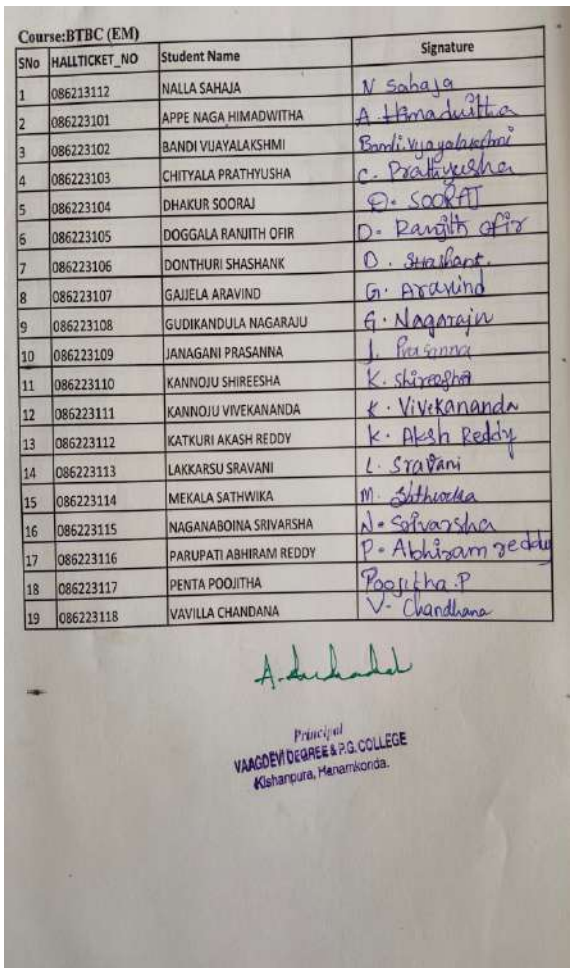
GROUP: BTBC/BTZC/BTBZ/BTMIZ/BTMIC

CLASS:SEMESTER-V/VI

TOPICS: 1) Artificial seed production.

2) Biodelignification.

LIST OF STUDENTS:



Course:BTBC (EM)

SNo	HALLTICKET_NO	Student Name	Signature
1	086213112	NALLA SAHAJA	N Sahaja
2	086223101	APPE NAGA HIMADWITHA	A Himadwitha
3	086223102	BANDI VIJAYALAKSHMI	Bandi Vijayalakshmi
4	086223103	CHITYALA PRATHYUSHA	C. Prathyusha
5	086223104	DHAKUR SOORAJ	D. SOORAJ
6	086223105	DOGGALA RANJITH OFIR	D. Ranjith ofir
7	086223106	DONTHURI SHASHANK	D. Shashank
8	086223107	GAJJELA ARAVIND	G. Aravind
9	086223108	GUDIKANDULA NAGARAJU	G. Nagaraju
10	086223109	JANAGANI PRASANNA	J. Prasanna
11	086223110	KANNOJU SHIREESHA	K. Shireesha
12	086223111	KANNOJU VIVEKANANDA	K. Vivekananda
13	086223112	KATKURI AKASH REDDY	K. Akash Reddy
14	086223113	LAKKARSU SRAVANI	L. Sravani
15	086223114	MEKALA SATHWIKA	M. Sathwika
16	086223115	NAGANABOINA SRIVARSHA	N. Srivarsha
17	086223116	PARUPATI ABHIRAM REDDY	P. Abhiram reddy
18	086223117	PENTA POOJITHA	Poojitha P
19	086223118	VAVILLA CHANDANA	V. Chandhana

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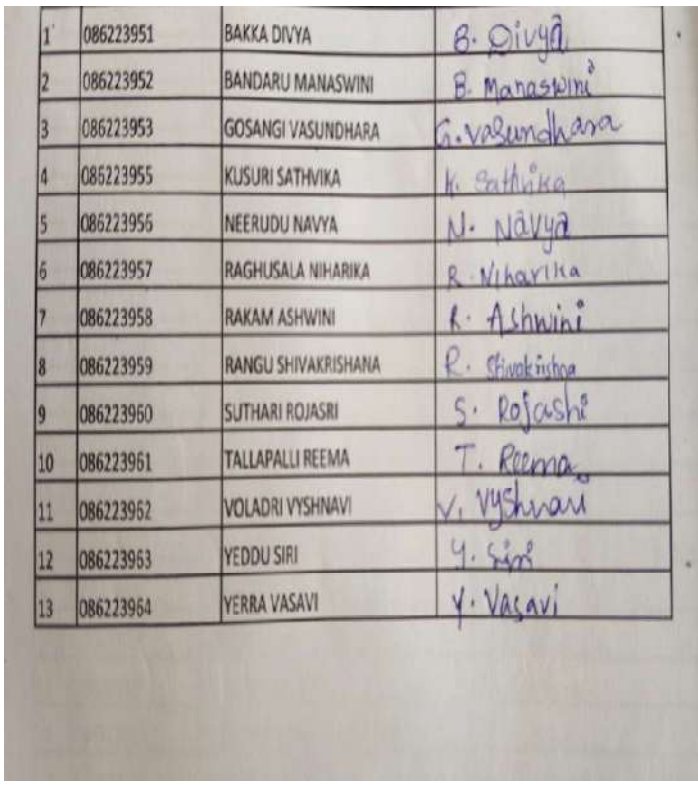

1	086223951	BAKKA DIVYA	B. Divya
2	086223952	BANDARU MANASWINI	B. Manaswini
3	086223953	GOSANGI VASUNDHARA	G. Vasundhara
4	085223955	KUSURI SATHVIKA	K. Sathvika
5	086223955	NEERUDU NAVYA	N. Navya
6	086223957	RAGHUSALA NIHARIKA	R. Niharika
7	086223958	RAKAM ASHWINI	R. Ashwini
8	086223959	RANGU SHIVAKRISHANA	R. Shivakrishna
9	086223960	SUTHARI ROJASRI	S. Rojashi
10	086223961	TALLAPALLI REEMA	T. Reema
11	086223962	VOLADRI VYSHNAVI	V. Vyshnavi
12	086223963	YEDDU SIRI	Y. Siri
13	086223964	YERRA VASAVI	Y. Vasavi

Course:BTMIC (EM)

SNo	HALLTICKET_NO	Student Name	Signature
1	086223001	AMARAJ VAMSHI	A. Vamshi
2	086223002	AYESHA FARHEEN	A. Farheen
3	086223003	BULLE SHIRISHA .	B. Shirisha
4	086223004	DEVUNURI SRIHARSHA KUMAR	D. Sriharsha Kumar
5	086223005	DURGALA VIGNESH	D. Vignesh
6	086223006	DURGAM SHASHIKANTH	D. Shashikanth
7	086223007	ESARAPU SATHWIK	E. Sathwik
8	086223008	ITHIREDDY SHIRISHAREDDY	I. ShirishaReddy
9	086223009	IYLA NITHISHA	I. Nithisha
10	086223010	JANGILI VINAY	J. VINAY
11	086223011	KALAKONDA VARUN	K. Varun
12	086223012	KASARLA MURALIKRISHNA	K. MuraliKrishna
13	086223013	KOTHAPELLY RESHMA	K. Reshma
14	086223014	KURIMILLA SATHWIKA	K. Sathwika
15	086223016	PALLERLA SOUMYA	P. Soumya
16	086223017	THEEGALA VIVEK CHAITHANYA	T. Vivek
17	086223018	THUMMALA SAI RAM	T. Sairam
18	086223019	VAJJAKESHAVULA PRANAY KUMAR	V. Pranay Kumar

Course:BTBZ (EM)

SNo	HALLTICKET_NO	Student Name	Signature
1	086223701	AZMEERA KEERTHANA	A. keerthana
2	086223702	BAVU AKHIL	B. Akhil
3	086223703	BONAGANI VARDHAN	B. Vardhan
4	086223704	JATTI KAVERI	J. kaveri
5	086223705	KANDIKONDA SAI RAM	K. Sairam
6	086223706	LINGAM VASAVYA	L. Vasavya
7	086223707	NAGABELLY SAI KRISHNA	N. Sai Krishna
8	086223708	ODELA VAMSHI	O. Vamshi
9	086223709	PADALA SATHWIKA	P. Sathwika
10	086223710	PORANDLA BHOOMIKA	P. Bhoomika
11	086223711	RAYIKANTI PRANAY	R. Pranay
12	086223712	SHAIK ASIF PASHA	S. Asif Pasha
13	086223713	SHIVARATHRI TEJASWI	S. Tejaswi
14	086223714	THALLA RUTHKIRAN	T. Ruthkiran
15	086223715	VISHNUBHAKTHULA RAKESH	V. Rakesh

Course:BTMIZ (EM)

SNo	HALLTICKET_NO	Student Name	Signature
1	086223801	AVULA RISHIVARUN	A. Rishivarun
2	086223802	BOLLAM HARIKA	B. HARIKA
3	086223803	ETALA AKSHAYA	E. Akshaya
4	086223804	GUNDETI HARINI	G. Harini
5	086223805	KUNTA VIJENDAR	K. Vijendar
6	086223806	KUSUMA BHAVANI	K. Bhavani
7	086223807	MOHAMMED KHAJA SHAMSHUDDIN	M. Khaja Shamshuddin
8	086223808	RAVULA SANDHYA	R. Sandhya
9	086223809	SUMAIYYA NAYEEM	S. Naayeem
10	086223810	VUSHAKOYALA NAVYA	V. Navya

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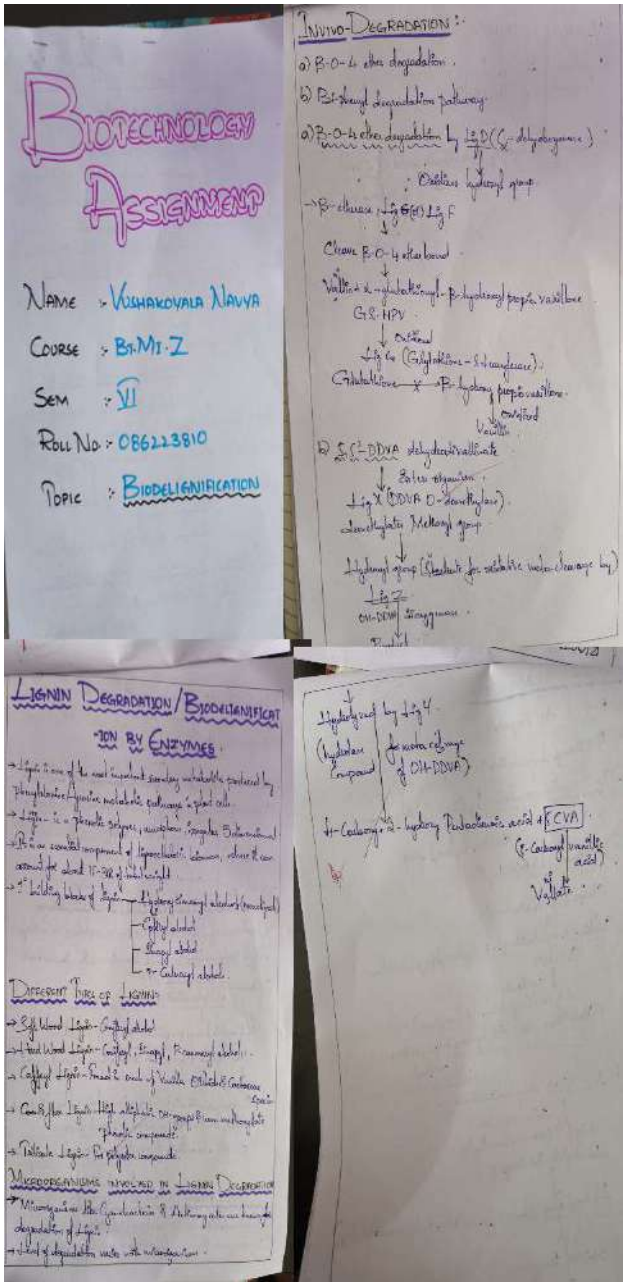
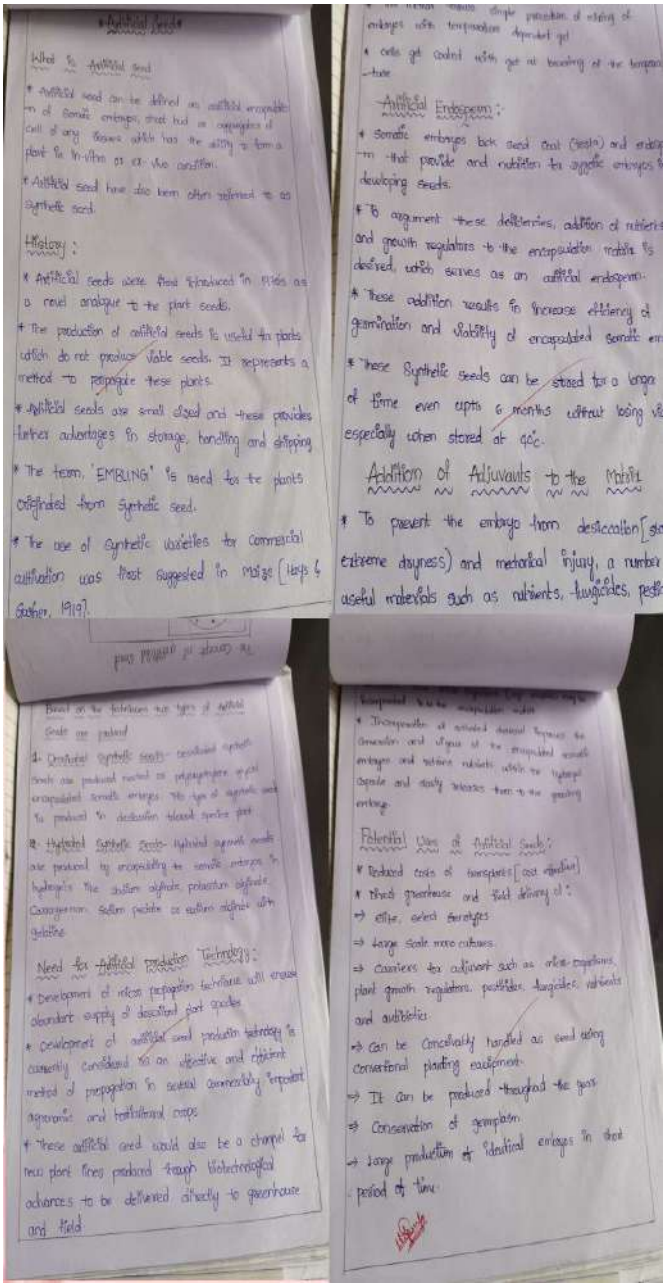
ASSIGNMENT:





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Kishanpura, Hanamkonda

GROUP: BTBC/BTZC/BTBZ/BTMIZ/BTMIC

CLASS:SEMESTER-III/IV

TOPICS: 1) prokaryotic transcription, splicing.

2) Measures of central tendency and dispersion.

LIST OF STUDENTS:

1	23-3-601	MOHAMMAD ANKUSHAWALI	M Ankushawali
2	23-3-602	BOJRA VIKRAM	B. Vikram
3	23-3-604	BOLLAM SRIVIDHYA	B. Srividhya
4	23-3-605	JANNU TEJASWITHA	J Tejaswitha
5	23-3-606	CHAPA MAHONNATH	Ch. Mahonnath
6	23-3-607	PURELLA SANKETHIKA	P. Sankethika
7	23-3-608	KASARLA MANASA	K. manasa
8	23-3-609	THUMMALA MOUNIKA	Mounika. T
9	23-3-610	DUMPALA SHIVATHMIKA	D. Shivathmika
10	23-3-611	KESHABOINA SRINITHA	K. Srinitha

A. Sadanandam

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Course: BTBZ (EM)

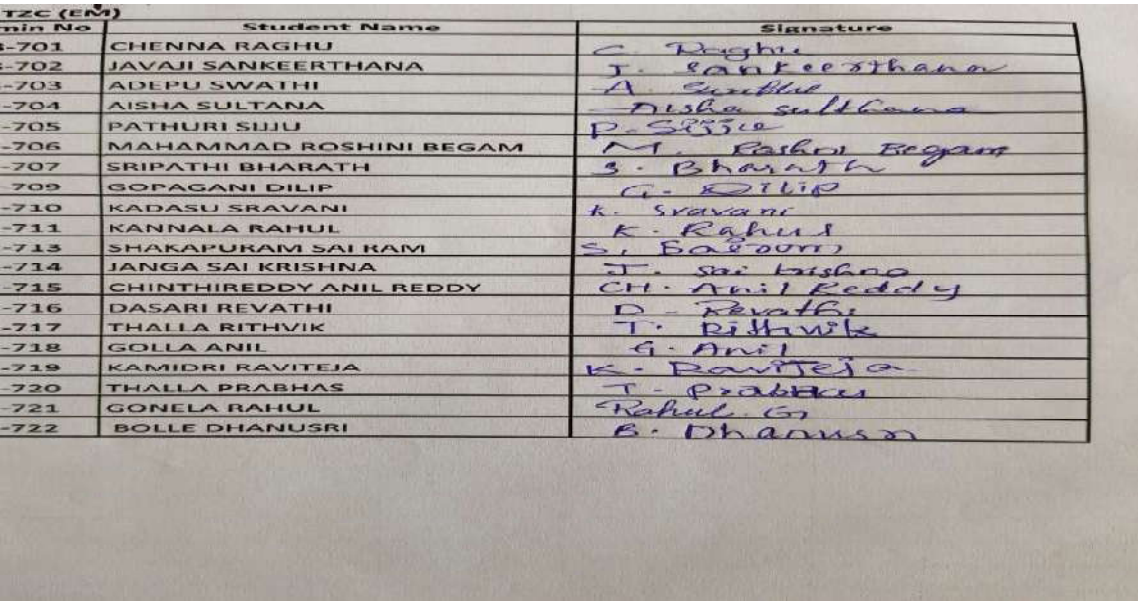
SNo	Admin No	Student Na	
1	23-3-903	POLU SANDHYA	
2	23-3-904	BALABATHULA AISHW	
3	23-3-906	JANNI SRAVYA	
4	23-3-907	GAJULA SHIVA	
5	23-3-908	GUDIKANDULA RAJ KUMAR	G. Raj Kumar
6	23-3-909	MANGA NITHIN	M. Nithin
7	23-3-910	TOLEM INDHU	T. Indu
8	23-3-912	PEDDI DIVYA	P. Divya
9	23-3-913	TEKUMATLA RAKESH	T. Rakesh
10	23-3-914	RAGI SHIVANI	R. Shivani
11	23-3-915	VUPPALA MUKTHA CHANDANA	V. Mukha chandana
12	23-3-916	AZMERI	Azmeri
13	23-3-917	NALLAGONDA AKSHITHA	N. Akshitha
14	23-3-918	GADDE SRIPRIYA	G. Sripriya

A. Sridhar Rao

Princ
Vaagdevi Degree
Kishanpura, H

Course: BTMIC (EM)

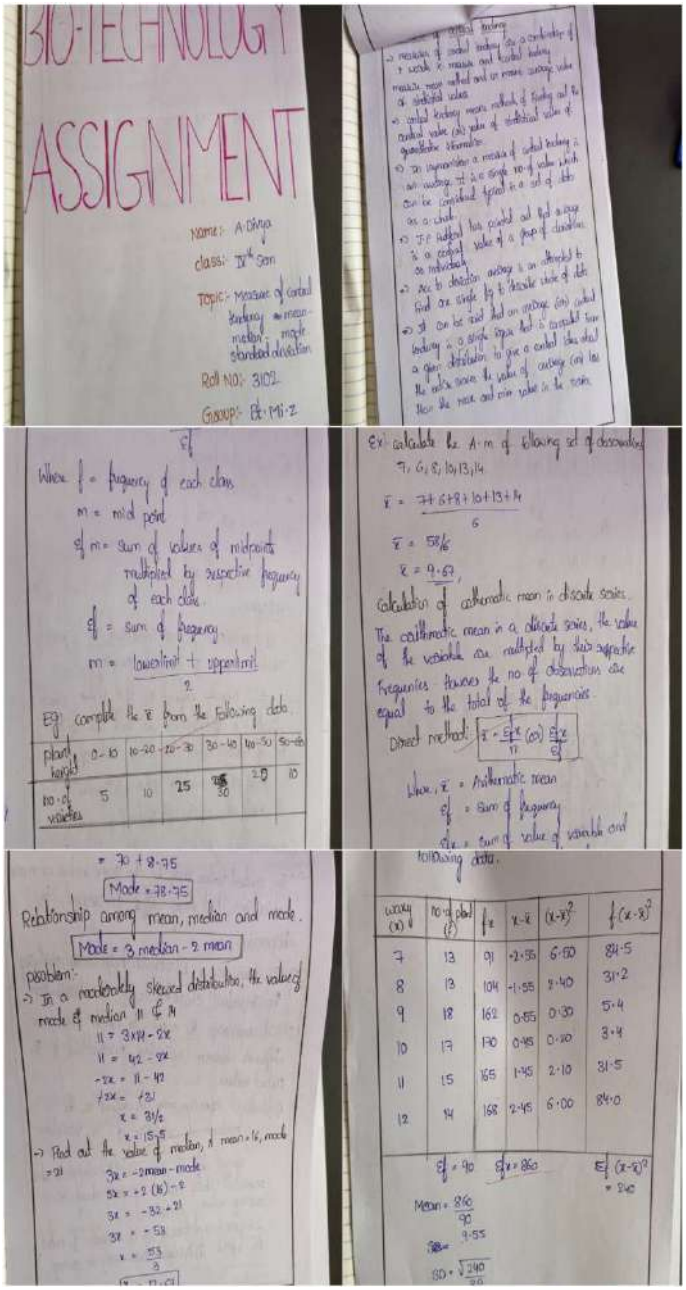
SNo	Admin No	Student Name	Signature
1	23-3-801	MANTHENA ROHITHA	M. Rohitha
2	23-3-802	NERA AISHWARYA	N. Aishwarya
3	23-3-803	MANDA MOKSHAGNA	M. Mokshagna
4	23-3-804	KARANGULA SUCHITHA	K. Suchitha
5	23-3-805	KUNAL BHADRA	K. Bhadra
6	23-3-806	BOMMATHI LASYAVARDHINI	B. Lasyavardhini
7	23-3-807	THOKALA ASHWINI	T. Ashwini
8	23-3-808	AKULA KALYANI	A. Kalyani
9	23-3-810	ALLABOINA GREESHMIKA	Greeshmika A
10	23-3-811	BANOTH SWAPNA	B. Swapna
11	23-3-812	SHANIGARAM SAI VAMSHI	S. Sai Vamshi
12	23-3-813	MEDIPELLY SOUMYA	M. Soumya
13	23-3-814	ANABHATHULA UMESH	A. Umesh
14	23-3-816	KUNDARAPU HARINI	K. Harini
15	23-3-817	ADEPU DEEPTHI	A. Deepthi
16	23-3-818	ARUKALA RAHUL	A. Rahul
17	23-3-819	KODAPAKA ISHWARYA	K. Ishwarya
18	23-3-820	BUKYA SWATHI	B. Swathi
19	23-3-821	MEKALA VINITHA	M. Vinitha

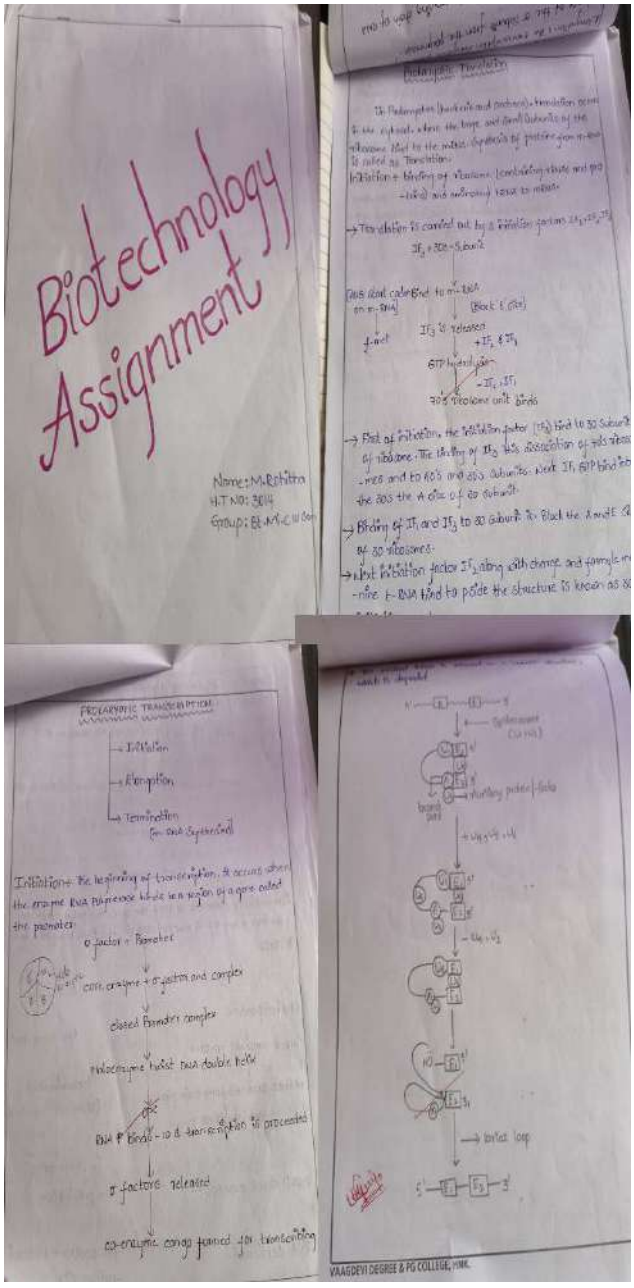


TZC (EM)

min No	Student Name	Signature
-701	CHENNA RAGHU	C. Raghu
-702	JAVAJI SANKEERTHANA	J. Sankeerthana
-703	ADEPU SWATHI	A. Swathi
-704	AISHA SULTANA	Aisha Sultana
-705	PATHURI SUJU	P. Suju
-706	MAHAMMAD ROSHINI BEGAM	M. Roshni Begam
-707	SRIPATHI BHARATH	S. Bharath
-709	GOPAGANI DILIP	G. Dilip
-710	KADASU SRAVANI	K. Sravani
-711	KANNALA RAHUL	K. Rahul
-713	SHAKAPURAM SAI RAM	S. Sairam
-714	JANGA SAI KRISHNA	J. Sai krishna
-715	CHINTHIREDDY ANIL REDDY	CH. Anil Reddy
-716	DASARI REVATHI	D. Revathi
-717	THALLA RITHVIK	T. Rithvik
-718	GOLLA ANIL	G. Anil
-719	KAMIDRI RAVITEJA	K. Raviteja
-720	THALLA PRABHAS	T. Prabhas
-721	GONELA RAHUL	Rahul. G
-722	BOLLE DHANUSRI	B. Dhanusri

Assignments:





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Principal
Vaagdevi Degree & P.G. College
Kishanpura, Hanamkonda

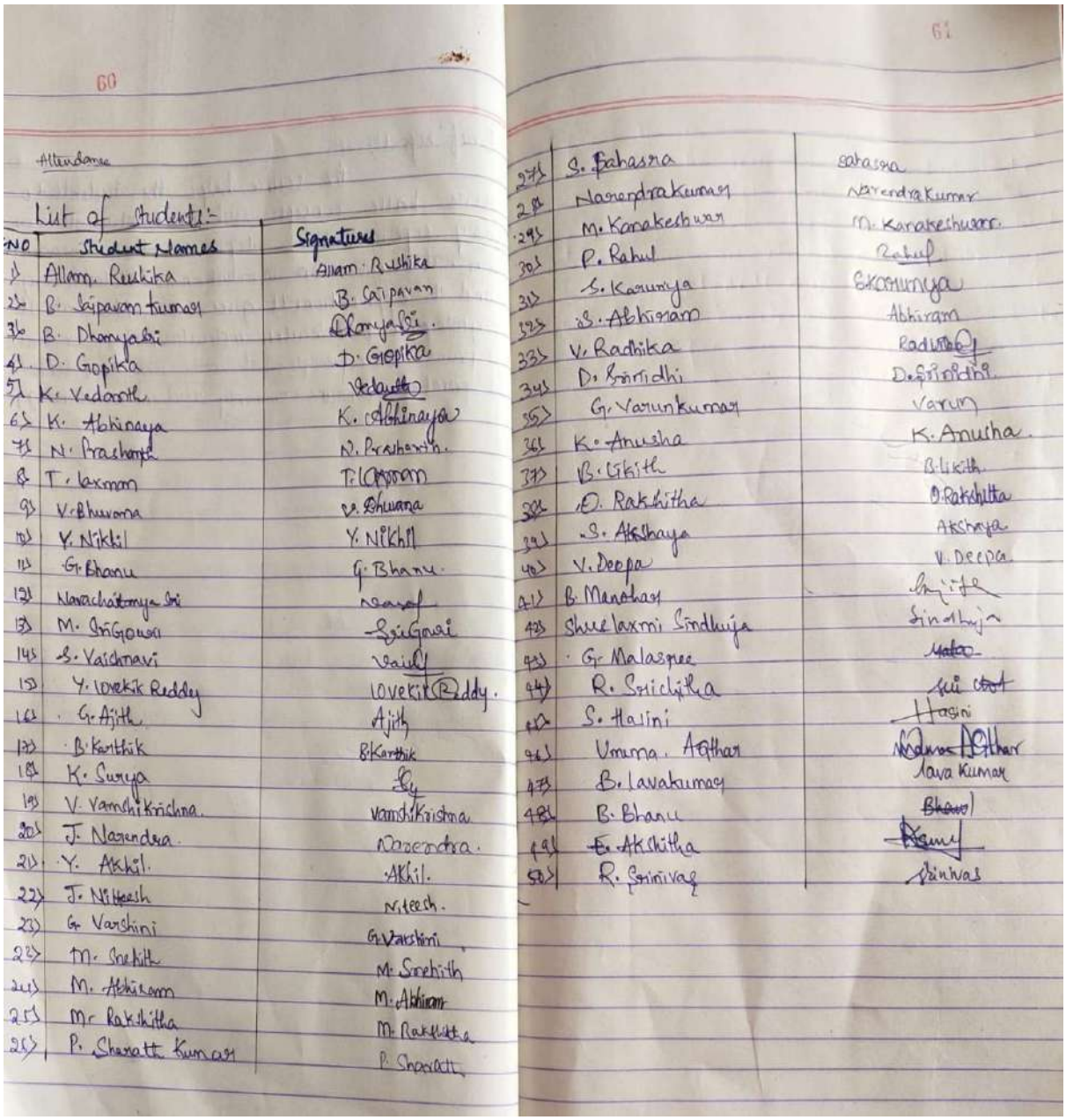
GROUP: BTBC/BTZC/BTBZ/BTMIZ/BTMIC

CLASS:SEMESTER-I/II

TOPICS: 1) Ultrastructure of prokaryotic cell.

2) Nutritional classification of bacteria.

LIST OF STUDENTS:



Attendance

List of Students:-

NO	Student Names	Signatures
1	Allam. Rushika	Allam Rushika
2	B. Saipavan kumar	B. Saipavan
3	B. Dhanyasri	Dhanyasri.
4	D. Gopika	D. Gopika
5	K. Vedanth	
6	K. Abhinaya	K. Abhinaya
7	N. Prashanth	N. Prashanth.
8	T. laxman	T.
9	V. Bhuvana	V. Bhuvana
10	Y. Nikhil	Y. Nikhil
11	G. Bhanu	G. Bhanu.
12	Navachaitanya Sri	
13	M. SriGowri	SriGowri
14	S. Vaishnavi	Vaishnavi
15	Y. Vivekik Reddy	Vivekik Reddy.
16	G. Ajith	Ajith
17	B. Karthik	B Karthik
18	K. Surya	
19	V. Vamshi Krishna.	Vamshi Krishna
20	J. Narendra.	Narendra.
21	Y. Akhil.	Akhil.
22	J. Nitheesh	Nitheesh.
23	G. Varshini	G. Varshini
24	M. Snehith	M. Snehith
25	M. Abhiram	M. Abhiram
26	Mr Rakshitha	M. Rakshitha
27	P. Sharath kumar	P. Sharath

27	S. Sahasra	Sahasra
28	Narendra kumar	Narendra Kumar
29	M. Kanakeshwar	M. Kanakeshwar.
30	P. Rahul	Rahul
31	S. Karunya	S Karunya
32	S. Abhiram	Abhiram
33	V. Radhika	Radhika
34	D. Sirisha	D. Sirisha
35	G. Varun kumar	Varun
36	K. Anusha	K. Anusha.
37	B. Likith	B. Likith.
38	D. Rakshitha	D. Rakshitha
39	S. Akshaya	Akshaya.
40	V. Deepa	V. Deepa.
41	B. Manohar	
42	Shivlaxmi Sindhuja	Sindhuja
43	G. Malashree	
44	R. Srichitha	
45	S. Hasini	Hasini
46	Umama. Akthar	
47	B. Lavakumar	Lava Kumar
48	B. Bhanu	
49	E. Akshitha	
50	R. Srinivas	Srinivas

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ASSIGNMENTS:

ASSIGNMENT

Subject : Bio Technology

Name : S. Rakshitha

Group : BZMPC- 2nd sem.

Hall Ticket No : 0824138006

Topic : Nutritional classification of Bacteria.

Submitted to : Sunitha mam.

the growth, reproduction and metabolism.

- This energy comes from Oxidations of different types of chemicals and elements present in our environment.

Nutrition :- It is a substance used in the synthesis of energy production and they are required for all living things.

- Bacteria required sources of carbon, nitrogen, phosphorous and ions and a large numbers of other nutrients.
- Carbon, nitrogen and water are used in high quantities.
- Nutritional requirements for bacteria can be grouped according to carbon and energy source.

→ Nutritional types of Bacteria :

I. On basis of energy source : 1) Photobiophs 2) Chemotrophs

II. On basis of electron source : 1) Lithotrophs 2) Organotrophs

Thus, bacteria can be

Photolithotrophs

Photoorganotrophs

NUTRITIONAL CLASSIFICATION

- Nutrients need energy and materials to complete various activities like growth, reproduction and metabolism.
- This energy comes from Oxidations of different types of chemicals and elements present in our environment.

Nutrition :- It is a substance used in the synthesis of energy production and they are required for all living things.

- Bacteria required sources of carbon, nitrogen, phosphorous and ions and a large numbers of other nutrients.
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→ Nutritional types of Bacteria :

I. On basis of energy source : 1) Photobiophs 2) Chemotrophs

II. On basis of electron source : 1) Lithotrophs 2) Organotrophs

Thus, bacteria can be

I. Electron donor :

i) Lithotrophs : Use inorganic compounds as electron donor.

ii) Photolithotrophs - Bacteria gain energy from light and they use inorganic compounds such as H_2S as source of electrons.

ex: Chromatium

iii) Organotrophs

iv) Chemolithotrophs - Bacteria gain energy from oxidation of inorganic compounds such as NH_3 as source of electrons.

ex: Nitrosomonas

v) Organotrophs :- Some organisms can use organic compounds as electron donor.

a) Photoorganotrophs - Bacteria gain energy from light and use organic compounds such as succinate as their source of electrons.

ex: Rhodospirillum

b) Chemoorganotrophs - Bacteria gain energy from chemicals and use organic compounds such as glucose, amino acids as a source of electron.

a) Chemoorganotrophs -

- These contain which can use light (from the light phase but have dark phase of Photosynthesis) and light pigments for their nutrition.
- Bacteria oxidize inorganic substances with the help of atmospheric oxygen.
- Energy released is used for synthesis process of the cell.

— Sulphurosus (Sulphur bacteria) :

- Obtain energy by oxidation of elemental sulphur/H_2S

ex: Thiobacillus, Beggiatoa

i) Elemental sulphur oxidizing bacteria :

Thiobacillus denitrificans : Oxidizing sulphur bacteria, oxidizes elemental sulphur to sulphuric acid.

$2S + 3H_2O + 3O_2 \rightarrow 2H_2SO_4 + 126$ K-cal

ii) Sulphide oxidizing bacteria :

Beggiatoa : oxidizes H_2S and release the sulphur

$2H_2S + 4O_2 \rightarrow 3H_2O + 2S + 112.2$ K-cal

Hydrogenosus (Hydrogen bacteria) :

They may be harmless/may cause diseases.

- Cause various diseases in plants and animals.

ex: B. typhosus, B. anthracis, B. tetani, Rhizobium, B. tuberculosis etc.

— Symbiotic bacteria :-

- These live in close association with other organisms as Symbionts.

ex: Rhizobium - live inside nodes of leguminous plants.

These fix atmospheric nitrogen into nitrogenous compounds which are utilized by plants. In return, Plant provide nutrients and protection to bacteria.

Common examples of N_2 fixing bacteria

ex: Beggiatoa, Azotobacter, Clostridium.

ASSIGNMENT

Subject : Bio-Technology

Name : Rakshitha. D

College : Vaagdevi Degree & PG College

Class : BSC Life Sciences I Semester

Group : BZMPC

Submitted to : Supraja Mam

Topic : Ultra structure of Prokaryotes

PROKARYOTES

ULTRA STRUCTURE OF PROKARYOTIC CELL

- Prokaryotic cell is the structural unit of two microbial groups
  - → Archaebacteria
  - → Eubacteria
- Despite variations in shape, size and fundamental structures are same.

Definition : Prokaryotes are organisms whose whole cell lack a nucleus and other organelles (membrane bound structures)

- Word Prokaryote comes from Greek words Pro-before/primitive / First formed ; Karyon - Nut / Kernel
- Each Prokaryotic cell consists of protoplasm encased with to Cell envelope.
- Ultra structure of Prokaryotic cell particularly a bacterial cell consists of cell envelope, cytoplasm, nucleoid, plasmids, surface appendages.
- Lacks eukaryotic organelles like mitochondria, endoplasmic reticulum and golgi bodies.

CELL ENVELOPE

- It is a protective covering of bacterial cell with three layers i.e., Glycocalyx, cell wall and cytoplasmic membrane.

I. Glycocalyx : Outermost layer of cell envelope.

- made up of polysaccharides
- when it becomes thick & tough it is called as "capsule"
- when it becomes loose & soft it is called as "Slime layer"
- Extracellular slimy loose sheath.

Functions : protects cell from dessication, toxins and phagocytes

helps to adhere, immunogenicity & virulence

II. Cell wall : It is rigid multilayered layer of cell envelope, composed of peptidoglycan with many units

Functions :

- Provides shape and rigidity to cell.
- It helps in preventing bacterium from osmotic bursting in a hypotonic solution.
- It helps in β-1,4 linkage formation.

→ In Gram positive bacteria : cell wall is single layered with thickness of 15-80 nm, having a thick peptidoglycan layer and no outer lipid membrane.

Peptidoglycan (15-80 nm) → Cell wall

Periplasmic space → cell membrane

Gram +ve

- It is gel like matrix composed of 80% water, proteins, nutrients, wastes, gases, inorganic ions and many low molecular weight compounds and cell structures such as ribosomes, chromatophores, nuclear material, inclusion bodies and mesosomes etc.

Functions : provides structure to cell, site of many metabolic reactions, the medium in which organelles are found.

i. Mesosome :

- These are infoldings of plasma membrane.
- When connected with nucleoid called Septal Mesosome, when it is not connected called Lateral Mesosome.
- Helps in cell wall formation, chromosome replication, secretory activity, increase surface area of plasma membrane.
- Site of respiratory enzymes hence called Mitochondria of prokaryotic cells / Bacterial mitochondria.

ii. Chromatophores :

- These are internal membrane systems of photosynthetic cells.
- These increase the metabolic area.

iii. Ribosomes :

- Prokaryotic organisms contain 70S type of ribosomes in nucleus with 50S larger subunit and 30S smaller subunit.

SURFACE APPENDAGES

- Surface appendages are present on bacterial cell, these may include flagellum, pili and fimbriae.

i. Flagella : - It is made up of "flagellin" protein.

- It is long, fine, hairy structure (1.5-15 μm) present on bacterial surface for movement.
- It helps in transition to a whip-like motion.

Flagellum has → Root body : made up of one ring (in G-ve) or two rings

→ Hook : It is curved structure, about 45 angles, that connects basal body and filament.

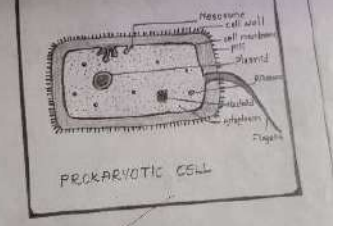
→ Filament : Hollow cylindrical structure about 0.02 μm long and 20 nm in diameter.

ii. Pili : These are tubular outgrowths of bacterial cell surface with 10-20 nm in length.

- It is made up of "Pilin" protein.
- It helps in conjugation.

iii. Fimbriae :

- These are hairlike surface appendages help in adhesion and mutual clinging.
- Length varies from 0.2-1.5 μm and diameter of 3-10 nm.



PROKARYOTIC CELL

A. Sreedhalaw
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VAAGDEVI DEGREE&P.GCOLLEGE

An Autonomous Organization
KISHNAPURA,HANAMKONDA

Class: Bsc.I Year-I semester
Subject:zoology
Group: BTBZ
Topic: Life cycle of Elphidium

S.NO	Hallticket no.	Name of the student	signature
1.	086243601	GUGULOTH AJITH	
2.	086243602	JANGA NITHEESH	
3.	086243603	JANGILI NARENDRA	
4.	086243604	BOLLAMPALLI KARTHIK	
5.	086243605	GORRE AKSHAYA	
6.	086243606	KODEPAKA SURYA	
7.	086243607	MERUGU AJAY	
8.	086243608	VANGARI VAMSHIKRISHNA	

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Kishanpura, Hanamkonda

Class: Bsc.I Year-II semester
Subject:zoology
Group: BZC
Topic: Scolidon respiratory system, parental care in amphibians

S.NO.	Hallticket no.	Name of the student	signature
1.	086243301	SORUPAKA ANKITHA	Ankitha
2.	086243302	AKULA SATHWIKA	Sathwika
3.	086243303	ALAKUNTLA MAHESH	Mahesh
4.	086243304	ARIDRAPU SRUTHI	Sruthi
5.	086243305	BANOTHU NIKITH	Nikith
6.	086243306	BATTINI LAXIMIPRIYA	Laxmi Priya
7.	086243307	BATTU KEERTHANA	Keerthana
8.	086243308	BUDIME RAMPRASAD	Ramprasad.
9.	086243309	CHALLAGOLLA NAVYA	Navya
10.	086243310	CHITTIMALLA RAHUL SAI	@ahul.
11.	086243311	D. SUDHA RANI	Sudharani
12.	086243312	DANDEMPALLY BHARATH	Bharath
13.	086243313	DHORI DIVYA	Divya
14.	086243314	EGGADI VARSHITHA	Varshitha
15.	086243315	ESLAVATH SAI	Sai
16.	086243316	GARDASU HARSHITH	Harshith.
17.	086243317	GIRABOINA SURESH	Suresh
18.	086243318	GOPAGONI NIKITHA	Nikitha
19.	086243319	KATLA UDAY KIRAN	Kiran

Principal
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Class: Bsc. II Year-I semester
Subject:zoology
Group: NDZC
Topic: Muscle contraction , social behavior

S.NO	Hallticket no.	Name of the student	signature
1.	086233401	AADIBA AZEEMUDDIN	Azeemuddin
2.	086233402	ASMA MAHAVEEN	Asmamahaveen
3.	086233403	AYESHA FARNAZ	Farnaz
4.	086233404	BASHABOINA HARIPRIYA	HariPriya.
5.	086233405	BHUKYA ANJALI	Anjali
6.	086233406	BHUPATHI KEERTHANA	Keerthana
7.	086233407	BOBBILI RAKSHITHA	Rakshitha
8.	086233408	BODA BHUVANA CHANDRA	Bhuvanachandra.
9.	086233409	BOINI UDAYA BHANU	Bhanu
10.	086233410	BOMMA PALLAVI	Pallavi
11.	086233411	BOYINI AKSHITHA	Akshitha
12.	086233412	CHELLOJU VYSHNAVI	vyshnavi
13.	086233413	CHENNURI SWETHA	Swetha
14.	086233414	CHITTEM SAI SHIREESH	S.Shireesh.
15.	086233415	GADDAM POOJITHA	Poojitha
16.	086233416	GALI PRAVEENA	Praveen
17.	086233417	GANTA SWETHA	Swe
18.	086233418	GOLKONDA ROHITH	Rohith
19.	086233419	JAKKULA HARIKA	Harika
20.	086233420	JANGA SANKALPITHA	Sankalpitha.
21.	086233421	JANNARAM VAISHNAVI	Vaishnavi
22.	086233422	KARAM LAXMISREEJA	Laxmisreeja.
23.	086233423	KARNAKANTI VAISHNAVI	Vaishnavi
24.	086233424	KAYITHOJU NANDINI	Nandini

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Kishanpura, Hanamkonda

Class: Bsc. II Year-II semester
Subject: zoology
Group: FSBZ
Topic: Plasma membrane, sex determination, types of eggs, placenta

S.NO	Hall ticket no.	Name of the student	signature
1.	086233131	DUPPATI VIKAS	Vikas
2.	086233132	AVULA SRIJA	Srija
3.	086233133	BACHATI AKHIL	Akhil
4.	086233134	BATTU ANUSHA	Anush
5.	086233135	BOINWAR AKHIL	Akhil.
6.	086233136	BUTTI SAMHITHA	Samhitha
7.	086233137	DATLA PRABHAS	Prabhas
8.	086233138	EDULAPURAM AMULYA	Amulya
9.	086233139	GADDAM PUNEETHA	Puneetha.
10.	086233140	GAJULA ABHIGNAY	Abhignay.
11.	086233141	GANAVENI DEVIPRIYA	Devipriya
12.	086233142	GANDE VARSHA	Varsha
13.	086233143	JAKKULA SAIKUMAR	Saikumar
14.	086233144	KUNSOTH SUMATHI	Sumathi
15.	086233145	MASNA PRAVALIKA	Pravalika
16.	086233146	MISBAH KAUNAIN	Kaunain
17.	086233147	MOGILI AJAY KUMAR	Ajay Kumar.
18.	086233148	MORTHALA NAVEEN	Naveen

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Kishanpura, Hanamkonda

Class: Bsc. III Year-I semester
Subject: zoology
Group: NDZC
Topic: Transgenic animals, r-DNA,technology

S.NO	Hallticket no.	Name of the student	signature
1.	086223151	ANNA NIKITHA	
2.	086223152	BASANI MANASA	
3.	086223153	BHUKYA INDU	
4.	086223154	BURRA RAMYASREE	
5.	086223155	CHEPURI DEEKSHITHA	
6.	086223156	CHIRRA SHIVA KUMAR	
7.	086223157	ENUKAMETLA SAITEJASWINI	
8.	086223158	GUNDA ANKITHA SREE	
9.	086223159	HEBA TABASSUM	
10.	086223160	KASHI RASHMIKA	
11.	086223161	KASUSAR FATIMA	
12.	086223162	KURIMINDLA SIRICHANDANA	
13.	086223163	MAZEEN FARHA	
14.	086223164	NEHA AFREEN	
15.	086223165	PASUNOORI VIJAYALAXMI	
16.	086223166	POLUDASARI NIHARIKA	
17.	086223167	POLUDASARI PRAVALIKA	
18.	086223168	PONGANTI AAKANKSHA	
19.	086223169	THUMUGANTI APARNA	
20.	086223170	ZAINAB GHAZALA	
21.	086223171	MOHAMMED SABA JABEEN	

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Class:Bsc.III Year-II Semester
Subject:zoology
Group: BZC
Topic- Ultra structure of skeletal muscle , Bohr effect , transport of co2

S.NO	Hallticket no.	Name of the student	signature
1.	086213356	NEERATI VAMSHI KRISHNA	Vamshikrishna.
2.	086223301	ADULA AKHIL	Akhil
3.	086223302	ADUNURI LOHITHA	Lohitha
4.	086223303	AJMEERA SOUJANYA	Soujanya.
5.	086223304	AMGOTHU RAJENDAR	Rajendar
6.	086223305	ARELLY MEGHANA	Meghana.
7.	086223306	AZMEERA HANMANTHU	Hanmanthu
8.	086223307	BANALA MADHUVANI	Madhuvani
9.	086223308	BANDARI PRAVALIKA	Pravalika
10.	086223309	BHUKYA ANKITHA	Ankitha
11.	086223310	BONTHALA NAGARAJU	Nagaraju
12.	086223311	BUSA RISHITHA	Rishitha
13.	086223312	CHINNALA ANANYA	Ananya
14.	086223313	DEVARAJULA KALYAN	Kalyan
15.	086223314	DHARAVATH GANESH	Ganesh.
16.	086223315	DUBYALA SAIKIRAN	Saikiran
17.	086223316	EDLA ASRITHA	Asritha
18	086223317	ERRA RANA PRATHAP	Rana Prathap.
19.	086223318	GAJIREDDY RAMADEVI	Ramadevi
20.	086223319	GAJEELA PRASANNA	Prasanna.
21.	086223320	GATTU VAMSHI	Vamshi
22.	086223321	GILAKATHULA BHAVANI	Bhavani.
23.	086223322	GODDE ARJUN NIVAS	Arjunnivas
24.	086223323	GUGULOTHU YOCHANA	Yochana.
25.	086223324	GUGULOTHU GANESH	Ganesh
26.	086223325	GUGULOTHU ROHITH KUMAR	Def
27.	086223326	GUGULOTHU SATHISH	Sathish
28.	086223327	GUMMADI AKHILA	Akhila.
29.	086223328	HAFIYA BANU	Banu

C. Padmavati
HEAD
Department of Zoology
VAAGDEVI DEGREE & P.G. COLLEGE
Hanamkonda

A. Sudhakar Rao
Principal
Vaagdevi Degree & P.G. College
Kishanpura, Hanamkonda