[illegible]

[illegible]

The [illegible] Person [illegible] Dr. [illegible]

Head [illegible]

[illegible]

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[illegible]

NOTICE

It is informed to all the students of [illegible] to attend the [illegible] Seminar (Topic — [illegible]) [illegible]

[illegible]

Organising Secretary

[illegible]

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhanjanagar

TOPIC : " An Overview of Population Explosion"
Date – [illegible]

1. Lighting the candle by Principal, Guest and respective :-
2. Puspanjalee to Lord Jagannath (Santipatha)
3. Chair addressed by
Prof Kumari Priyadarsani Pradhan Dept of Edn.
4. Opening song by : Miss Sujata Mohanty & Miss Rashmi Rana
5. Paper presented by the students :
Miss Sabita Rana,+3 2nd yr Arts
Miss Madhavi Jena ,+3 2nd yr Arts
Mr Mithun Sahu +3 1st yr Arts
Miss Asmita Dakua, +3 3rd yr Arts
6. Chief Guest :- Dr. Sujata Kumari Patra,
Biju Pattanaik Womens College,Digapahandi
7. Chief Speaker : – Sri Duryodhan Pradhan, Dept of Edn.
Khemundi College,Digapahandi
8. Speech by President : Prof. Raghunath Nayak,Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
Lect.in-Education

Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following students were [illegible]

[illegible]

[illegible] of Population [illegible]

The rapid growth of the world's [illegible] over the last one hundred years [illegible] difference between the rate of birth and the rate of death. The human population will [illegible] people on the earth [illegible]. This is [illegible] the whole population of [illegible] on the [illegible] population. The growth in human population [illegible] the world [illegible] of people [illegible] to [illegible] on the [illegible] and [illegible] the [illegible] of population growth is now a [illegible] of human well-being. Unfortunately, the [illegible] which [illegible] population growth [illegible] take place [illegible] the future. The purpose of this [illegible] is [illegible] some important [illegible] about [illegible] population.

In the [illegible] and [illegible] deaths [illegible] used to limit population growth [illegible] world. Thanks to [illegible] reduction [illegible] and [illegible] health [illegible] the [illegible] growth [illegible] which [illegible] of a [illegible] continuously high [illegible] is causing a rapid population [illegible] in many countries in Asia, Latin America and Africa and people generally [illegible] over-population is [illegible] the [illegible] of having more people than can live on the earth in comfort, happiness and health and [illegible] leave the world a fit place for future generations.

Until recently [illegible] rates and death rates were about the same, [illegible] population [illegible] and many children, but a large number of them [illegible] before [illegible]. During the Industrial Revolution, a period of [illegible] in Europe and North America [illegible] transformed from rural [illegible] where [illegible] making the [illegible] for [illegible] people [illegible] in several factors [illegible] to the production and distribution of improvements in [illegible] health (water and sanitation) and [illegible] medical [illegible] (vaccines and antibiotics) along with gains in [illegible] and standards of living within many countries [illegible] children's [illegible] without [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] people [illegible] [illegible] [illegible] [illegible] [illegible] information spread [illegible] growth rates and improving the quality of life of most people.

The second most important factor is urbanization [illegible] people from rural to urban areas.

Lecture No-2

the Second Departmental Seminar to held in the Department [illegible] [illegible]
[illegible]

The [illegible] Person was Dr. [illegible]
Head, [illegible]
[illegible] Women's College, [illegible]
[illegible]
Head [illegible]
[illegible]

[illegible]
1. [illegible] per hour
2. [illegible] per hour
3. [illegible] per hour
4. [illegible] per hour

OFFICE OF THE PRINCIPAL, [illegible]

N O T I C E

Date: [illegible]

It is informed to all the students of [illegible] to attend the Departmental Seminar (Talk) on [illegible]

[illegible] to [illegible] [illegible]

Organising Secretary

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhanjanagar

TOPIC : " An Overview of Population Explosion"
Date - [illegible]

1. Lighting the candle by Principal, Guest and respective :-
2. Puspanjali to Lord Jagannath (Santipatha)
3. Chair addressed by
   Prof Kumari Priyadarsani Pradhan Dept of Edn
4. Opening song by : Miss Sagrika Mohanty & Miss Rashmi Rana
5. Paper presented by the students :
   Miss Nalini Rana,+3 2nd yr Arts
   Miss [illegible] Jena ,+3 2nd yr Arts
   Mr Mithun Sethy +3 1st yr Arts
   Miss Asmita Dalua, +3 3rd yr Arts
6. Chief Guest :- Dr. Sujata Kumari Patra,
   Biju Pattnaik Womens College,Digapahandi
7. Chief Speaker : - Sri Duryodhan Pradhan, Dept of Edn.
   Khemundi College,Digapahandi
8. Speech by President : Prof. Raghunath Nayak,Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
   Lect.in-Education

Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following students were [illegible]

[illegible]
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[illegible]

[illegible] of Population [illegible]

The rapid growth of the world's [illegible] the past [illegible] years [illegible] between [illegible] of people [illegible]. The human population [illegible] people in the [illegible]. This is [illegible] the whole population of cities [illegible] population, the growth in human population [illegible] the world [illegible] of people [illegible] and [illegible] population growth [illegible] of human well being. Unfortunately, the [illegible] population growth [illegible] for the future. The purpose of this [illegible] is [illegible] important [illegible] about over-population.

In the past few decades and [illegible] to [illegible] population growth [illegible] world, thanks to improved nutrition, [illegible] and medical [illegible], [illegible] the [illegible] of [illegible] high [illegible] of a [illegible] rapid population [illegible] in many countries in Asia, Latin America and Africa and people generally [illegible]. Over-population is leading [illegible] the condition of having more people than can live on the earth in comfort, happiness and health and still leave the world a fit place for future generations.

Until recently, [illegible] [illegible] and [illegible] [illegible] [illegible] about the same. [illegible] [illegible] [illegible] and many children, but a large number of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] in Europe and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] to [illegible] [illegible] [illegible] improvements in food production and distribution of [illegible] and of medical [illegible] health (water and sanitation) and [illegible] (housing and construction) along with gains in [illegible] [illegible] and standards of living [illegible] of most people.

The second most important factor is urbanisation [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

15

[illegible]

[illegible]

[illegible]

[illegible]

OFFICE OF THE PRINCIPAL [illegible]

N O T I C E

Date: [illegible]

[illegible]

[illegible]

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
[illegible] Degree Mahavidyalaya, [illegible]

TOPIC : "Education is an Instrument of Social Change"
Date : [illegible]

1. Lighting the candle by Principal, Guest and respective [illegible]
2. Pushpamalya to Lord Jagannath [illegible]
3. Chair addressed by : Prof Kumari Priyadarsani Pradhan, Dept of Edu.
4. Opening song by : Miss Sujata Mohanty & Miss [illegible] Rana
5. Paper presented by the students :
   Mr Ramesh Maharana, +3 2nd yr Arts
   Mr [illegible], +3 2nd yr Arts
   Miss [illegible], +3 2nd yr Arts
   Miss Dipti Rani Sahu, +3 2nd yr Arts
6. Chief Guest : Dr. Rajesh Kumar Patra, Dept of Edu. [illegible] Mahavidyalaya, [illegible]
7. Chief Speaker : Sri [illegible] Pradhan, Dept of Edu. [illegible] College [illegible]
8. Speech by President : Prof. Raghunath Nayak, Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan, Lec in Education

Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following students [illegible] 17

[illegible] Maharana
[illegible] Rana
[illegible]
[illegible] Sahu
[illegible] Ganesh
[illegible] Patel
[illegible]
M. [illegible] Rao
Sasmita Sahoo
Sudhyarani Dhuria
Swastik Dutt
Swati Kota
[illegible] Nayak
[illegible] Swain
Ipsita Sahoo
Ipsita Biswal
[illegible] Sahu
Sangita Mohanty
Swati Lenka
Sangita rani Panda
Dr. Sarojini Dey
[illegible] Dhangar
[illegible]
[illegible]
P. [illegible] Reddy
A. Priya Reddy
[illegible] Dehury
Geeta Das
[illegible]
[illegible] Singh
[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

Education is an Instrument of Social change

"Education is the most powerful weapon which you can use to change the world" Education is the medium through which we can change the world. It helps us to know whatever the changes happen in the society. It helps us in identifying problems present around us in our society and also helps us providing the best solutions.

It helps us in developing the mental ability of a person which in turn changes the way a person thinks. This results in the change of patterns of social relationship and hence it may cause social change. One of the main functions of Education is to change the attitude, thinking and lifestyle of a person.

According to "[illegible] social change refers to the alteration of mechanisms within the social structure, characterised by changes in cultural symbols, rules of behaviour, social organisations, or value systems.

Hence, it means that to change man is to change a society. only when a person gets educated he/she knows that what is right or wrong. Thus, education not only prepares a person for social change but also encourages and inspires a person to proceed in the direction of social change.

According to [illegible] dictionary, education [illegible] of changes and improvements in the social system [illegible] institution [illegible] [illegible] [illegible] [illegible] a change and [illegible] education system [illegible] social changes, education brings change in society, [illegible] as a person's life and hence education can be regarded as the [illegible] instrument [illegible] social change.

Our Indian history had a number of [illegible] and [illegible] social reformers like Swami Vivekananda and Raja Ram Mohan Roy, Dayanand [illegible] and Mahatma Gandhi who [illegible] [illegible] an important role in the process of bringing out social changes, many reform movements were led by these reformers.

15

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
[illegible] Degree Mahavidyalaya, [illegible]

TOPIC : "Education is an Instrument of Social Change"
Date : [illegible]

1. Lighting the candle by Principal, Guest and respective /
2. Pushpamalya to Lord Jagannath ([illegible])
3. Chair addressed by : Prof Kumari Priyadarsani Pradhan, Dept of Edu.
4. Opening song by : Miss Sujata Mohanty & Miss [illegible] Rana
5. Paper presented by the students :
   - Mr Ramesh Maharana, +3 3rd yr Arts
   - Mr [illegible], +3 3rd yr Arts
   - Miss Sonali Rana, +3 3rd yr Arts
   - Miss Dipti Rani Sahu, +3 3rd yr Arts
6. Chief Guest : Dr. Rajesh Kumar Patra, Dept of Edu. [illegible] Mahavidyalaya, Chilika
7. Chief Speaker : Sri Dibyadhan Pradhan, Dept of Edn. [illegible] College, Digapahandi
8. Speech by President : Prof. Raghunath Nayak, Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan, Dept of Education

Prof Kumari Priyadarsani Pradhan
Organising Secretary

[illegible] following students [illegible] 17

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Lipika Paul
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] Biswas
[illegible] Biswas
[illegible]
[illegible] Mohanty
[illegible]
[illegible]
Dr. [illegible] Deb
[illegible]
[illegible]
[illegible]
P. [illegible] Reddy
A. [illegible] Reddy
[illegible]
[illegible] Das
[illegible]
[illegible] Singh
[illegible]

[illegible]
[illegible]
[illegible]
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[illegible]
[illegible]

Education is an Instrument of Social change

"Education is the most powerful weapon which you can use to change the world" Education is the weapon through which we can change the world. It helps us to know whatever the changes before the society. It helps us in identifying problems present among us in the society and also helps us in founding the their solutions.

It helps us in increasing the mental ability of a person which in turn changes the way a person thinks this results in the change of pattern of social relationship and thus brings social change. One of the main objective of Education is to change the attitude, thinking and lifestyle of a person.

According to "[illegible] Social change refers to the alteration of mechanisms within the social structure, characterised by changes in cultural symbols, rules of behaviour, social organisations, or value systems.

Hence, it means that to change man is to change a society only when a person gets educated he/she know that what is right or wrong. Thus, education not only prepares a person for social change but also encourages and inspires to proceed in the direction of social change.

According to [illegible] dictionary, [illegible] of changes and improvements in the social system [illegible] institution [illegible] [illegible] [illegible] [illegible] a change and [illegible] education system [illegible] social change, education brings change in society, [illegible] as a [illegible] life and hence, education can be regarded as the greatest instrument for social change.

Our Indian history had a number of important and notable social reformers like Swami Vivekananda and Raja Ram Mohan Roy, Rabindranath Tagore and Mahatma Gandhi who took an important role in the process of bringing out social changes. Many reform movements were led by these reformers.

[illegible]

[illegible]

[illegible]

[illegible]

N O T I C E   Date [illegible]

[illegible]

Organising Secretary

[illegible]

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
Kamajee Degree Mahavidyalaya,Bhismagiri)

TOPIC :- " Standardization of a Test "
(Date :- 17.08.2021)

1. Lighting the candle by Principal, Guest and respective
2. Puspamalya to Lord Jagannath (Santiparba)
3. Chair addressed by
   Prof Debadatta Panda,Lect.in-Odia.
4. Opening song by : Miss Jugyani Dora & Madhusmita Behe

5. Chief Guest :- Dr. Rajesh Kumar Patra,
   Chikiti Mahavidyalaya,Chikiti

6. Chief Speaker :- Dr. Sujata Kumari Patra,
   Rja Pattanik Womens College,Digapaha

7. Speech by President : Prof. Raghunath Nayak,Principal

8. Vote of thanks by : Prof Kumari Priyadarsini Pradhan,
   Lect.in-Education

Prof Kumari Priyadarsini Pradhan
Organising Secretary

[illegible]

Students attendance sheet

Name of the event: [illegible] of Education

Topic: Standardization of a Test

Sl no.	Name of the student	Phone no.
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] Mahavidyalaya [illegible], Ganjam, Odisha

Student Attendance sheet

Name of the event : Departmental Seminar of Education

Topic: Standardization of a Test

S.no	Name of the student	Phone no.
[illegible]	[illegible]	[illegible]


DEPARTMENT OF EDUCATION


DEPARTMENT OF EDUCATION

Background [illegible]

Standardized [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] is broadly defined as the [illegible] and [illegible] of [illegible] the [illegible] [illegible] [illegible] [illegible] the end of the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

The demand for [illegible] [illegible] [illegible] [illegible] in 2012 was [illegible] by [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the school year, [illegible] [illegible] [illegible] [illegible] goals and [illegible] the [illegible] [illegible] [illegible] the end of the year of grades [illegible] [illegible] [illegible] [illegible] [illegible] and the [illegible] [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] students will [illegible] to the next grade. [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] [illegible] [illegible] high numbers of students [illegible] [illegible] [illegible] [illegible] [illegible] at the end of year [illegible] could have negative consequences on a school.

There are many types of [illegible] used in school systems in the United States.

It is also a form of a test, one of the most commonly used standardized test.

Aptitude tests:-

Aptitude tests measure what a [illegible] general learning, within a particular subject area. For example, the Scholastic Aptitude test measures [illegible] knowledge in the areas of reading, math and [illegible] colleges [illegible] on the SAT [illegible] typically choose to make admission decisions [illegible] typically show students' abilities to be successful in higher education settings.

Intelligence tests:-

Typical intelligence tests are used to determine a student's mental abilities. Results are [illegible] high range for the student to be placed in a gifted and talented program or low range to be referred for special education. These types of tests are generally administered by a psychologist or anyone else trained to give the test and interpret the results.

Seminar No. 1

The Guest Departmental [illegible]
and by The Department [illegible] on 18 [illegible] 2019
on Topic "Educational Problems & Controversial
Aspects of [illegible]"

[illegible] [illegible] [illegible]

To Dr. [illegible]
Head of the Dept. of
Education

To Dr. [illegible] [illegible]
Head of the Dept of
Education
B.P. [illegible] College [illegible]

[illegible] [illegible] organised by the students of
1) Miss [illegible] [illegible] [illegible]
2) Miss [illegible] [illegible] [illegible]
3) Miss [illegible] [illegible] [illegible]
4) Miss [illegible] [illegible] [illegible]

OFFICE OF THE PRINCIPAL [illegible] COLLEGE [illegible]

NOTICE

Date: [illegible]

It is informed to all the students of [illegible] [illegible]

Department [illegible] (Topic - Educational Problems [illegible]) on

[illegible] at [illegible] [illegible]

[illegible]

Principal

DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF EDUCATION,
[illegible] Degree Mahavidyalaya, Bhismagiri

Topic : Educational Problems & Educational Aspiration of the SC & ST
Date : [illegible]

1. Lighting the Candle by Principal, Guest and respective [illegible]
2. Pushpanjali to Lord Jagannath (Santipath)
3. Chief welcomed by
   Prof Kumari Priyadarsani Pradhan Dept of Edn
4. Opening song by : Miss Puja Rana & Miss Rohini Rana
5. Paper presented by the students
   Miss Nalini Rana +3 1st yr Arts
   Miss Minakshi Gouda +3 2nd yr Arts
   Miss Asmita Dakua +3 2nd yr Arts
   Miss Nikita Nayak +3 2nd yr Arts
6. Chief Guest : Smt. Gayatri Das, Dept of Edn
   Tara Tarini College, Purushottampur
7. Chief Speaker : Dr. Sujata Kumari Patra,
   Biju Pattanaik Womens College, Digapahandi

8. Speech by President : Prof. Raghunath Nayak, Principal

9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
   Lect in Education

Prof Kumari Priyadarsani Pradhan
Organising Secretary

[illegible]

[illegible]

[illegible] Independence [illegible]

[illegible]

After Independence [illegible]

Independence [illegible]

[illegible] five year plan [illegible]

[illegible] according [illegible]

[illegible]

[illegible] Level of [illegible] according to [illegible] local population [illegible] total production [illegible].

The probable [illegible] [illegible] which is [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF ZOOLOGY,
[illegible] Degree Mahavidyalaya, [illegible]

TOPIC : R-DNA TECHNOLOGY Date : [illegible]

INAUGURAL SESSION

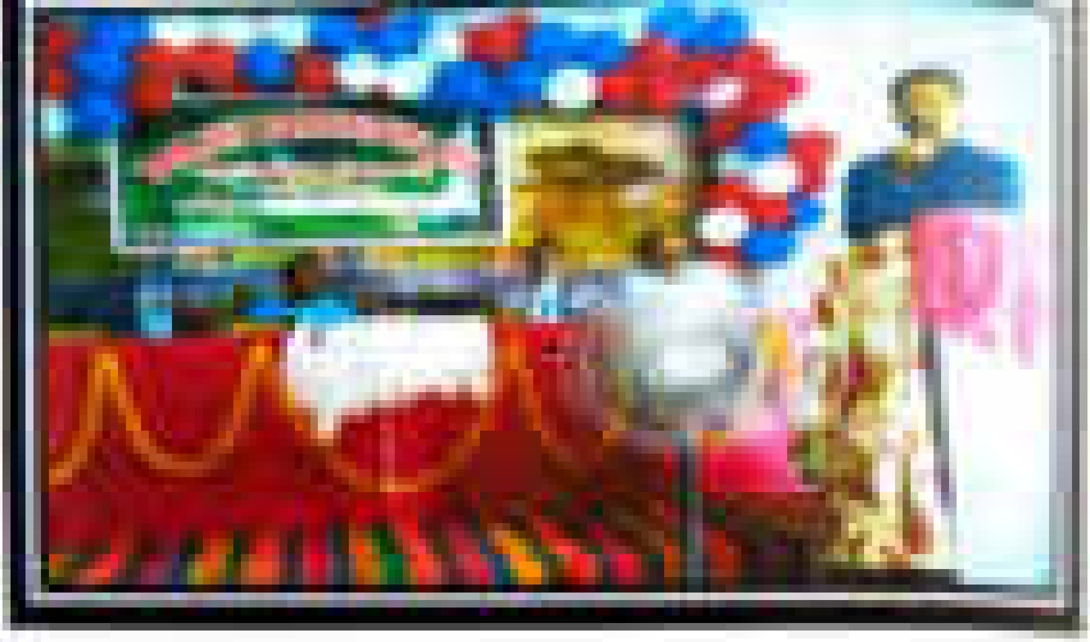
1. Lighting the candle by Principal, Guest and [illegible] :-
2. Garland to Lord Jagannath [illegible]
3. Chair addressed by :-
   Prof. Lingaraj Panigrahy, Dept of Zool.
4. Opening song by :- Miss [illegible]
5. Speech by President :- Beloved Principal

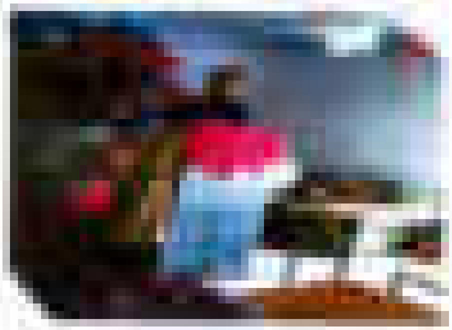
SEMINAR SESSION

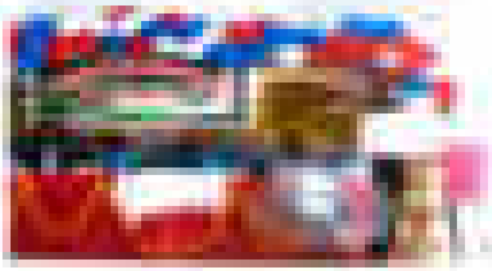
6. Paper presented by the students :-
   Mr. [illegible]
   Miss [illegible]
   Miss [illegible]
   Mr. [illegible]
7. Paper presented by the staffs :-
   Prof. Lingaraj Panigrahy, Dept.of Zoology
8. Seminar Topic By Chief Guest :-
   Dr. K.Krishna Raju Patro, Lect-in-zoology
   (Science college Kukudakhandi, Kukudakhandi)
   Research Person
9. Seminar Topic By Chief Speaker :- Mrs. [illegible] Patro,
   Khemundi college, Digapahandi

VALEDICTORY SESSION

10. Vote of thanks by :- Prof. Lingaraj Panigrahy, Dept.of Zool.







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mRNA [illegible]

[illegible]

[illegible]

[illegible]

[illegible] OLIDATOR [illegible]

[illegible]

[illegible] ATION METHOD [illegible]

[illegible]

[illegible] MEDIATED GENE TRANSFER [illegible]

[illegible] of DNA [illegible]

[illegible]

PROCEDURES

[illegible]

[illegible]

[illegible]

[illegible]

AGENDA

[illegible] SEMINAR [illegible] OF ZOOLOGY [illegible] DATE [illegible]

[illegible]

SEMINAR SESSION

[illegible]

VALEDICTORY SESSION

[illegible]

[illegible]

[illegible]
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10

[illegible] | Seminar

IDT

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[illegible]

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[illegible]

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[illegible]

[illegible] 1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

[illegible]

[illegible]

DEPARTMENT SEMINAR

DEPARTMENT OF ZOOLOGY

Organized by : [illegible]

[illegible] Date : [illegible]

Time : [illegible]

INAUGURAL SESSION

1. Lighting the candle by [illegible]
2. [illegible]
3. [illegible]

Prof. [illegible], Dept. of Zool.

4. Opening song by : [illegible]
5. Speech by President : [illegible]

SEMINAR SESSION

6. Paper presented by the students :

[illegible]

[illegible]

[illegible]

[illegible]

7. Paper presented by the staff :

Prof. [illegible], Dept. of Zoology

8. Seminar Topic By Chief Guest :

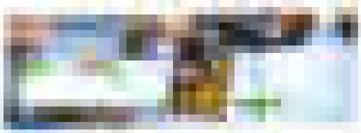
Dr. [illegible]

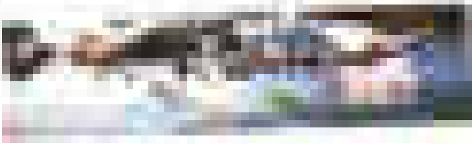
[illegible] College, [illegible]

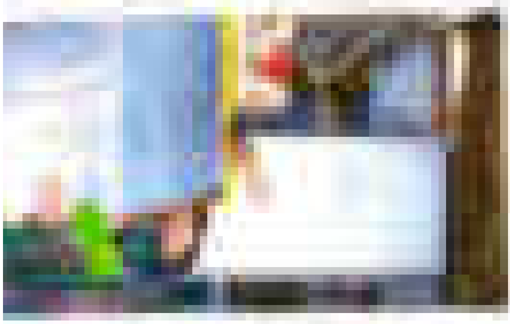
[illegible]

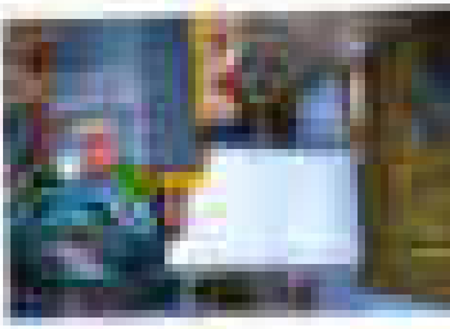
VALEDICTORY SESSION

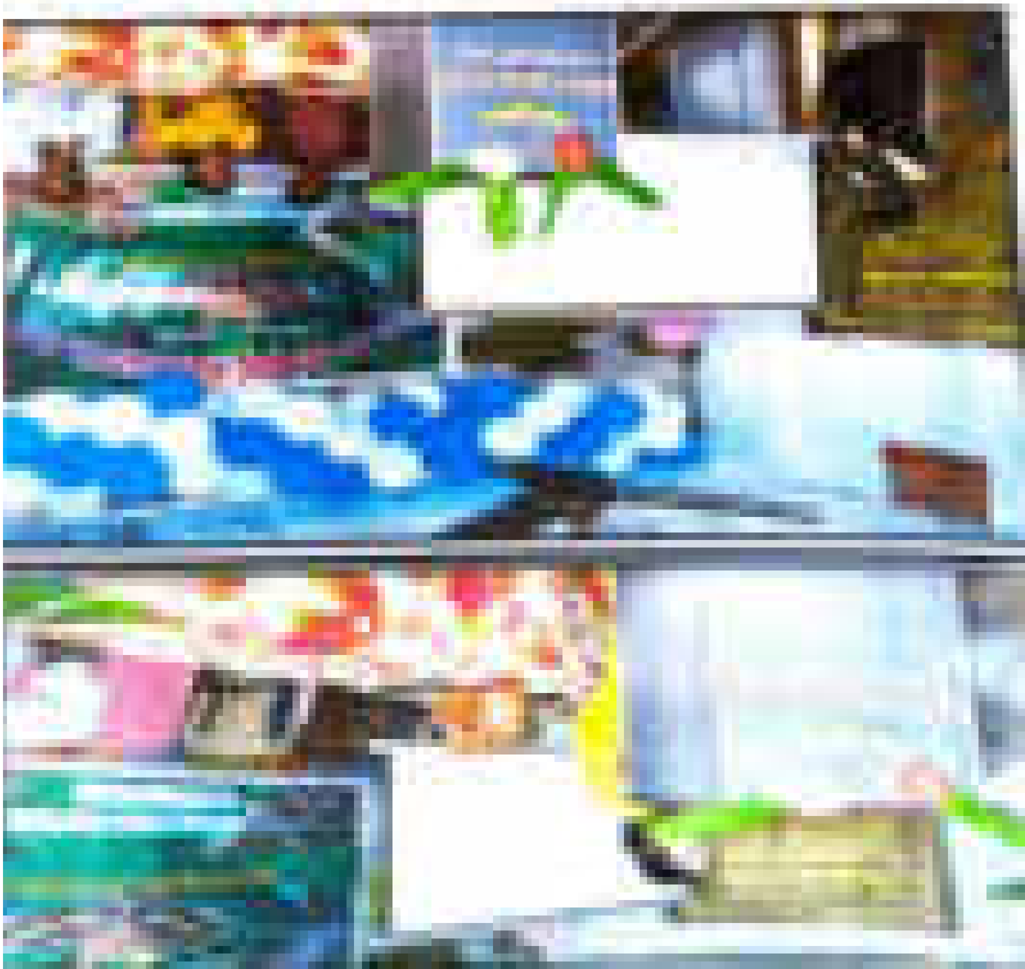
9. Vote of thanks by Prof. [illegible], Dept. of Zool.











[illegible]

[illegible]

[illegible]

1. [illegible]
   1. [illegible]
   2. [illegible]
   3. [illegible]
   4. [illegible]

[illegible]

[illegible]

DEPARTMENT SEMINAR

Organized by: Department of Zoology, [illegible]

Topic: [illegible] Date: [illegible]

INAUGURAL SESSION

1. Lighting the candle by Principal, Guest and [illegible]
2. [illegible]
3. Chief guest [illegible] by: Prof. [illegible] Head of Dept.
4. Opening song by: [illegible]
5. Speech by President: [illegible] Principal

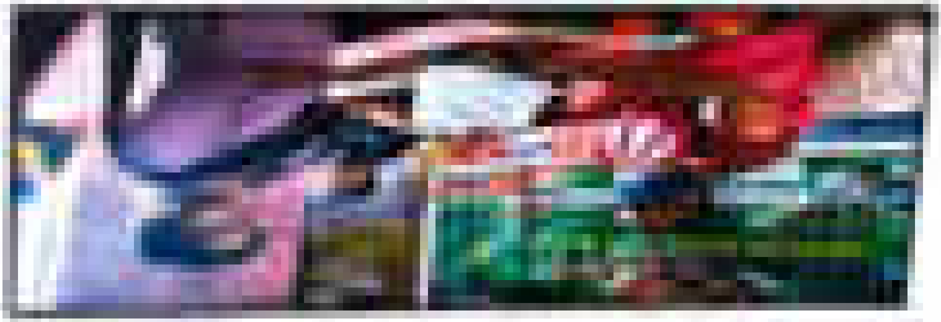
SEMINAR SESSION

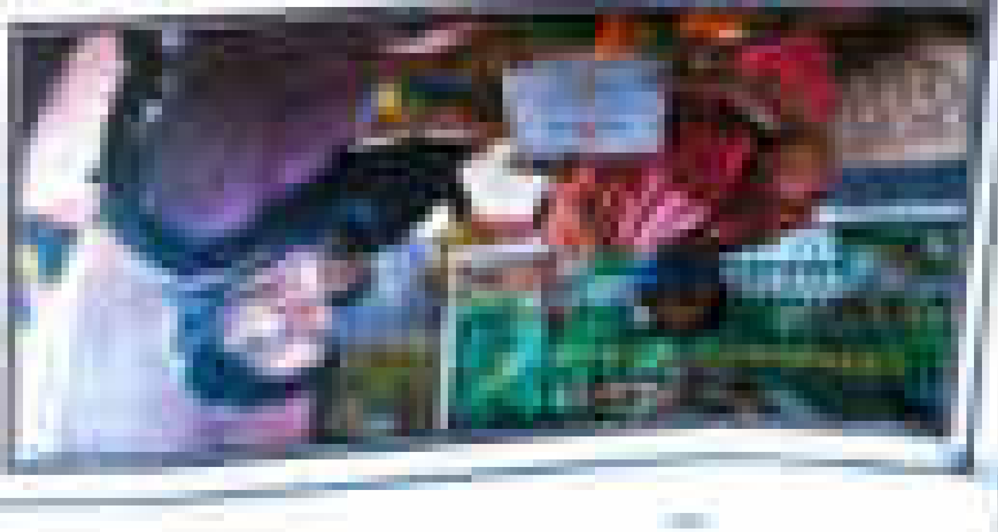
6. Paper presented by the students:
   [illegible]
   [illegible]
   [illegible]
   [illegible]
7. Paper presented by the staffs: Prof. [illegible] Head of Zoology
8. Seminar Topic By Chief Guest: Dr. [illegible] [illegible] [illegible]
9. Seminar Topic By Chief Speaker: [illegible] [illegible]

VALEDICTORY SESSION

10. Vote of thanks by: Prof. [illegible] Head of Dept.

[illegible]





Seminar No. [illegible]

[illegible]

[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible]
Chemistry

The [illegible] [illegible] [illegible]
1. [illegible] [illegible] [illegible]
Deptt. of Chemistry

2. Dr. [illegible]
Deptt. of Chemistry

[illegible] [illegible] of [illegible] [illegible] by the
students were
1. [illegible] [illegible] ([illegible])
2. [illegible] [illegible] ([illegible])
Workshop and application
of Green Chemistry

Notice

OFFICE OF THE PRINCIPAL, [illegible]

NOTICE Date: [illegible]

[illegible] Chemistry [illegible] [illegible]

[illegible] Green Chemistry [illegible]

10 [illegible]

AGENDA

ORGANISED SEMINAR (DEPT.OF CHEMISTRY) Date-21/12/2016

Topic on –Green Chemistry

INAUGURAL SESSION

1. Lighting the candle by Principal, Guest and respective :-
2. Garland to Lord Jagannath (Saraswati)
3. Opening song by : Miss Bandana Panda .
4. Introducation of Chief Guest, Chief Speaker and welcoming address by : Sri Laxmikanta Mahapatra,Dept.of Chem.
5. Speech by President : Dr.Judhistira Swain,Principal

SEMINAR SESSION

6. Paper presented by the students :
   1.Mr Manoj Kumar Gouda ,+3 2nd Science
   2.Chandra Sekhar Das, ,+3 1st Science
7. Paper presented by staff Members :-
   1.Sri Laxmikanta Mahapatra,Dept.of Chem.
   2.Sri Narayana Biswasraya, Dept.of Chem.
8. Seminar topic by Chief Guest :- Prof.Prafulla Kumar Rauta,
9. Seminar topic by Speech Speaker: Prof Himansu Sekhar Mishra

VALEDICTORY SESSION

10.Vote of thanks by : Sri Narayana Biswasraya, Dept.of Chem.

Organizing Secretary

Students attendance 11.4/23

1. [illegible] Kr. [illegible]
2. [illegible]
3. [illegible] Ghosh
4. [illegible]
5. [illegible]
6. [illegible]
7. Apurba Kr. Das
8. [illegible]
9. [illegible] Kr. Das
10. [illegible] Sethy
11. [illegible] panda
12. [illegible] panda
13. [illegible]
14. [illegible] panda
15. [illegible]
16. [illegible]
17. [illegible]
18. A. Ramachandran
19. [illegible]
20. [illegible]
21. [illegible]
22. [illegible] Mukherjee
23. [illegible]
24. [illegible] Reddy.
25. [illegible] MALLIKA
26. [illegible] pradhan
27. [illegible]
28. [illegible]
29. [illegible]
30. [illegible]
31. [illegible] Mukherjee

[illegible] Mukherjee
[illegible] in Check

[illegible] proposed by [illegible]

It is better to prevent waste than to treat or clean up the waste after it is formed.

Synthetic methods should be designed to maximise the incorporation of all materials used in the process into final product.

Wherever practicable, synthetic methodologies should be designed to use and generate substances that possess little or no toxicity to human health and the environment.

Chemical products should be designed to preserve efficacy of function while reducing toxicity.

The use of solvents should be [illegible].

Synthetic methods should be conducted at ambient temp and pressure.

A raw material should be renewable.

Unnecessary use of blocking group, protection/deprotection should be avoided.

9) The catalytic reagent are superior to stoichiometric reagents.

10) Chemical products should be designed so that at the end of their function they don't persist in env and break down into innocuous degradation products.

11) Analytical methods should be further developed to allow for real time, in-process monitoring and control prior to formation of hazardous substances.

⑫ Substances and the form of a substance used in a chemical process should be chosen to minimize potential for chemical accidents, including releases, explosions and fires.

Green Chemistry and its principles

Defⁿ – The design of chemical products and processes that are more environmentally friendly and reduce negative impact to human health and the environment.

The concept of green chemistry was formally established at the Environmental protection agency. It grew up in response to the pollution prevention act of 1990.

Paul T Anastas for the first time in 1991 coined the term Green Chemistry. Paul T Anastas and John C Warner developed 12 principles of green chemistry which are –

(a) Prevention
(b) Atom economy
(c) Less hazardous chemical synthesis
(d) Designing safer chemicals
(e) Safer solvents and auxiliaries.
(f) Design for energy efficiency
(g) Using renewable feedstocks.
(h) Reduce derivatives.
(i) Catalysis
(j) Designs for degradation
(k) Real time analysis for pollution prevention
(l) Inherently safer chemistry for accident prevention.

The above principles are explained below.

SEMINAR BY
DEPARTMENT OF CHEMISTRY

Seminar No-1 [illegible]

[illegible] the second department seminar was held in the department on dt [illegible] on topic "Organic Chemistry and its applications"

[illegible] [illegible] [illegible]

1. [illegible]

[illegible] list of paper presented by students

1. [illegible] [illegible] ([illegible])
2. [illegible] [illegible] ([illegible])

Notice -

OFFICE OF THE PRINCIPAL, [illegible]

NOTICE

Date: 21.12.18

It is informed to all the Student of B.Sc. Chemistry department [illegible] organic Chemistry and its app. [illegible] [illegible]

[illegible]

[illegible]

AGENDA

ORGANISED SEMINAR (DEPT.OF CHEMISTRY) Date-22/12/2017
Topic on – Organic Chemistry and its Application

INAUGURAL SESSION

1. Lighting the candle by Principal, Guest and respective :-
2. Garland to Lord Jagannath [illegible]
3. Opening song by : Miss Sagarika Pradhan & Miss Tanisa Rout .
4. Introducation of Chief Guest, Chief Speaker and welcoming address by : Sri Laxmikanta Mahapatra,Dept.of Chem.
5. Speech by President : *Sri Raghunath Nayak, Principal*

SEMINAR SESSION

6. Paper presented by the students :-
   1.Mr Mitu Gouda ,+3 1st Science
   2.Miss Mamata Mishara ,+3 3rd Science
7. Paper presented by staff Members :-
   1.Sri Laxmikanta Mahapatra,Dept.of Chem.
   2.Sri Narayana Biswasraya, Dept.of Chem.
8. Seminar topic by Chief Guest :- Prof.Prafulla Kumar Rauta,

9. Seminar topic by Speech Speaker: Sri Laxmikanta Mahapatra, Dept.of Chem.

VALEDICTORY SESSION

10.Vote of thanks by : Sri Narayana Biswasraya, Dept.of Chem.

Organizing Secretary

Students attendance sheet 31

1 Manisha Das
2 Liza Mahto
3 Aditi Jena
4 Ghanashyam Jena
5 Dhaman Mishra
6 Gopal Chandra Sahu
7 [illegible] Munji
8 Dillip Kumar Munji
9 [illegible] Dishayi
10 Sujit Sahadya
11 Bikash Dhangda
12 Rabin Das
13 Bramhanada Mallik
14 Rama Ch. Mallik
15 Ramachandra Pradhan
16 Krishna Prasad Munji
17 Ardhayam Pradhan
18 Raja Jaman Reddy
19 Sanjay Nayak
20 Sagar Dalai
21 Nila Nayak
22 Manoj Kr. Swain
23 Chandra Sekhar Das
24 Shiva Nayak
25 A Ramachandran
26 Satish Kumar Sahu
27 Chandan Kr. Panda
28 Laxman Sahu
29 Debiprasad Sarangi
30 Meera Sethi
31 Sujata Pradhan

[illegible] [illegible]

[illegible] Chand

Notes prepared by [illegible]

Organic Chemistry and its Applications

Organic chemistry is the study of compounds that contain carbon. It is one of the major branches of chemistry. [illegible] of compounds [illegible] [illegible] which have been built up by the chemist in the lab by methods he has devised.

It is important because it is the study of life and all of the chemical reactions related to life.

Organic chemistry plays [illegible] [illegible] [illegible] development of [illegible] [illegible] chemicals - foods, plastics, drugs, fuels etc.

Among the numerous types of organic compounds four major categories are found in all living things: carbohydrates, lipids, proteins and nucleic acids. [illegible], aspirin, [illegible] [illegible] and [illegible] are examples of substances that [illegible] drugs [illegible] to be obtained directly from nature [illegible] and manufactured [illegible] from organic materials.

Ethylene is the gas that [illegible] fruit and is [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

Methane is a member of alkane [illegible] [illegible] hydrocarbons

Starch is a storage carbohydrate manufactured by plants when plant photosynthesise, the result of the [illegible] from sunlight to convert [illegible] and [illegible] into [illegible]

Glycogen is a storage carbohydrate used by animals. Cellulose is a polysaccharide that is used in plant cell walls as their structure.

Humans feed on amino acids and utilize them in synthesizing the polymers called protein.

(i) This used in the production of soaps, shampoos, powders and perfumes.

(ii) Various fuels like natural gas, petroleum, are also organic compounds.

(iii) The fabrics that are used to make various dresses are also made from organic compounds.

(iv) Chemistry organic compounds play an important and useful role towards the development and growth of a number of industries like glass, cement, paper, textile, leather, dye, drugs, polymers, petroleum, plastics, paints, pigments, pharmaceuticals. Most products we use involve organic chemistry.

Seminar-4 Dt-23/11/17

The first Departmental Seminar organised by Department of Botany on 23/11/17 [illegible]

[illegible]

Resource person [illegible]

[illegible]

[illegible] of Students Departmental papers presented by

1. [illegible]

2. [illegible]

3. [illegible]

Notice:

OFFICE OF THE PRINCIPAL [illegible]

NOTICE Date 20.11.17

It is announced to all the Students of 1st, 3rd, 5th Sem Hons. [illegible] Seminar [illegible] on 23/11/17 [illegible] 1PM

[illegible]

AGENDA

ORAGANISED SEMINAR (DEPT. OF BOTANY)DATE-27-01-2017

INAGURAL SESSION

1.Lightening the candle by President, Guest and respective.

2.Garland to Lord Jagannath(invocation)

3.Opening song by Miss Sunita Mishra and [illegible] Behera

4.Introduction- Chief Guest,Chief Speaker,and welcoming address by Prasanta Kumar Panda, Dept.Botany

5.Speech by President.

SEMINAR SESSION

6.Paper presented by students:

Miss Sunita Mishra

Mr Debendra Dash

Mr Bikram Panigrahy

7.Paper Presented by staff members:

Sri Sudhir Ranjan Behera

Sri Prasanta Kumar Panda

8.Seminar Topic by Chief Guest:- Dr. Subhashree Choudhury

9.Seminar Topic by Speech Speaker: Dr Jagannath Mishra

VALEDICTORY SESSION

10.Vote of Thanks by : Sri Prasanta Kumar Panda,Dept.Botany

Student Attendance Sheet

[illegible]

1. Sradha [illegible]
2. Sibani Sinha
3. Krishna Pradhan
4. [illegible] Priyadarshini
5. Debasmita Jena
6. Rajalaxmi Swain
7. Priyanka Dalai
8. Rajlaxmi Mandal
9. Sasmita Behera
10. [illegible] [illegible]
11. Dhiren [illegible] [illegible]
12. Dhanya [illegible]
13. Ashok Panda
14. Subhalin Nayak
15. M. Kiran
16. Bhavani Sahu
17. Rupali Rani Sethi
18. [illegible]
19. Jyotsna Panda
20. L. Prasanti Archana
21. Subash [illegible]
22. Tulasirani Panda

Photograph Gallery

Important use of Biofertilizer

- A biofertilizer is a substance which contains living microorganisms.
- Biofertilizer when applied to seed, plant surfaces or soil, colonizes the interior of the plant and promote growth by increasing nutrients to the host plant.
- Bio-fertilizer add nutrients through the natural process of nitrogen fixation, solubilizing phosphorus and stimulating plant growth through the synthesis of growth promoting substances.

What is Biofertilizer?

- Biofertilizer are natural fertilizers that are microbial inoculants of bacteria, algae and fungi
- which may help biological nitrogen fixation for the benefit of plants
- They help build up the soil micro-flora and there by the soil health
- Biofertilizer also include organic fertilizers like manure, compost etc.
- Use of bio-fertilizer is recommended for improving the soil fertility in organic farming

Types of biofertilizers

- Bacterial, Fungal, Algal, Aquatic ferns and Earthworms

Bacterial Biofertilizers

- These microbes contain unique gene called as nif gene which make them capable of fixing nitrogen
- The nitrogen fixing bacteria work under two conditions - symbiotically, non-symbiotically

⇒ The symbiotic bacteria make an association with
host plants through forming nodules on their roots.
⇒ The non-symbiotic bacteria donot form any nodules
but live freely and fix the atmospheric nitrogen

Symbiotic nitrogen fixers

⇒ Most important symbiotic nitrogen fixer is
Rhizobium and Azospirillum

Rhizobium

⇒ Rhizobium lives in the root hairs of the legumes
by forming nodules.
⇒ Plant root supply essential minerals and many
organic compounds to the bacteria.
⇒ The range Rhizobium was established by/Rhizobium may
fix 50-300 kg/ha

Azospirillum

⇒ It mainly present in cereal plants.
⇒ Inhabit both root cells as well as surrounding
of roots.
⇒ Forming symbiotic relation and increasing
nitrogen fixing potential of the cereal plant.
⇒ Azospirillum is recognized as a dominant soil
organism.
⇒ Nitrogen in the range of 20-40 kg/ha in the
rhizosphere in non-leguminous plants such as
cereals, millets, oilseeds, cotton etc.
⇒ Considerable quantity of nitrogen fertilizer
upto 25-30% can be saved by the use of
Azospirillum inoculant.
⇒ These species have been commercially exploited
for the use as nitrogen supplying/biofertilizer

Azotobacter

⇒ It is a heterotrophic free living nitrogen fixing
bacteria.

Merits of Biofertilizer:

→ By addition to nitrogen, the decomposed manure provides phosphate, zinc, phosphorus to the crop.

→ Increase of crop yield upto 15-20%.

→ Biofertilizer are quality fertilizer, however it has Advantage & Disadvantage

→ Renewable source of nutrients.

→ Sustain soil health, supplement chemical fertilizers.

→ Replace 25-30% chemical fertilizers.

→ Increase the grain by 10-20%.

→ Decompose plant residues and stabilizes carbon and nitrogen ratio of soil.

→ Improve texture, structure and water holding capacity of soil.

→ No adverse effect on plant growth and soil fertility.

→ Stimulate plant growth by secreting growth hormones.

→ Secrete fungistatic and antibiotic like substances.

→ Solubilize and mobilize nutrients.

→ Eco-friendly, non-pollutant, cost effective method.

Disadvantage.

→ Biofertilizer require special care for long term storage because they are alive.

→ Must be used before their expiry date.

→ If other microorganisms contaminate the carrier medium or if growers use wrong strain.

→ Biofertilizers lose their effectiveness if the soil is too hot or dry.

Sources: Google, Internet.

Paramita Kumari Panda

Deptt. of Botany

- Actinomycetes is the most commonly occurring species in aerobic soils of world.
- Actinomycetes producing antibiotics, growth promoting substances such as vitamins and gibberellins and hormones.
- Many species of Actinomycetes exhibit fungicidal properties against certain species of fungus.
- As composer [illegible] soil aggregation and plant growth.

Algae as a biofertilizer

- Another group of free living nitrogen fixers are cyanobacteria.
- Commonly called as blue green algae.
- More than 100 species of BGA can fix nitrogen.
- Nitrogen fixation takes place in specialized cells called heterocysts.
- BGA very common in rice field.
- Algae can easy to produce.
- Usually they are mass produced by [illegible] along with [illegible]
- Not require processing, [illegible] and [illegible]
- Cost is very much less so [illegible]
- Beneficial in certain crops like vegetables, cotton, sugarcane etc.
- Some of algal biofertilizers are - Nostoc, Anabaena, Oscillatoria

Azolla as a biofertilizer

- Azolla is a tiny fresh water fern common in ponds, ditches and rice fields.
- It has been used as a biofertilizer for rice in all major rice growing countries including India, Thailand, Korea, West Africa.
- The nitrogen fixing work is accomplished by the symbiotic relationship between fern and BGA.

Seminar - 12 24/02/18

On 24/02/18 the Department of Botany organised a Seminar on Conservation of Biodiversity Room no. 108.

Resource person - Dr. [illegible]
Dr. [illegible]
Chief speaker - Dr. [illegible] Dash

Three no. of students presented papers.

1. Miss A. Barik, [illegible]
2. Miss [illegible] Behera, [illegible]
Endemic Species
3. Miss [illegible] Rath
Biodiversity of Odisha and India.

[illegible]

NOTICE

Date: 23/2/18

It is intimated to all the students of +3 1st, 2nd, 3rd Yr B.Sc. (Hons) to attend the Departmental Seminar on Conservation of Biodiversity - 24/02/18 at 10 a.m. [illegible] 108

[illegible]

AGENDA

ORAGANISED SEMINAR (DEPT. OF BOTANY)DATE-24-09-2018

INAGURAL SESSION

1.Lightening the candle by Principal, Guest and respective.

2.Garland to Lord Jagannath(Saraswatha)

3.Opening song by Miss Sibani Sahu and Sriparna Padhy

4.Introduction: Chief Guest,Chief Speaker,and welcoming address by Prasanta Kumar Panda, Dept.Botany

5.Speech by President.

SEMINAR SESSION

6.Paper presented by students:

Mr. A. Ashok kumar Pradhan

Miss Sriparna Padhy

Miss Sibani Sahu

7.Paper Presented by staff members:

Sri Sudhir ranjan Hota

Sri Prasanta Kumar Panda

8.Seminar Topic by Chief Guest: Miss Priya Ranjani Maharana

9.Seminar Topic by Second Speaker: Sri Gopinath Mishra

VALEDICTORY SESSION

10.Vote of Thanks by : Sri Prasanta Kumar Panda,Dept. Botany

Student Attendance Sheet

1. Sumit Paik
2. Priyanka Dhara
3. Krishna Pradhan
4. Rabindra Mondal
5. Dibakar Dalui
6. Sabina Bagchi
7. Anu Mondal
8. Asish Mridha
9. Ananya Pradhan
10. Arpita Mondal
11. Susanta Pradhan
12. Sanu [illegible]
13. Prabir Adhikari
14. Sumita Barik
15. Ananda Jana
16. Bidyapati Saha
17. [illegible] Das
18. Sudakshina Ghosh
19. [illegible] Mitra
20. [illegible] [illegible]
21. Gopal Saha
22. Sukanta Majhi

Botany & [illegible] Department Seminar on Conservation of Biodiversity

Biodiversity Conservation

⇒ Biodiversity is the variety and differences among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and ecological complexes

⇒ Biodiversity is the totality of genes, species and ecosystems of a region

⇒ Types of biodiversity

⇒ Ecosystem diversity

⇒ It refers to the diversity of a place at the level of ecosystem. this has 3 perspectives

⇒ Alpha diversity :- within community diversity

⇒ It refers to the diversity of organisms sharing the same community/habitat

Beta diversity

⇒ Between community diversity

⇒ It refers to the diversity of organisms sharing two habitat

⇒ Gamma diversity :-

⇒ Diversity of the habitat over the total landscape or geographical area is called gamma diversity

Species diversity

⇒ It refers to the variety of species with in a region

⇒ Species diversity is an index that incorporates the number of species in an area and also their relative abundance

⇒ It is [illegible] & which gives useful value along species richness

Genetic diversity

⇒ It is the level of biodiversity that refers to the total number of genetic characteristics in the genetic makeup of a species

→ It is distinguished from genetic variability which describes the tendency of genetic characteristics to vary.

Values of Biodiversity

Food

→ Humans have used plants and about 80% of present day food crops have been domesticated from wild.

→ Drugs and Medicines

→ About 75% of world's population depend on plants and plants extracts.

Fuels

→ Forests have been used since ages for fuelwood.

→ Fossil fuels are also products of biodiversity.

Social values

→ Many of the plants like tulsi, lotus, peepal etc are considered holy and sacred.

→ About 2.1 million species have been identified till date, while many more species are exist.

Conservation of Biodiversity

→ The Convention on Biological diversity held in June 1992 stressed the need of the conservation of biodiversity for sustainable development and perpetuation of human beings on earth.

→ Conservation is defined as the management of human use of the biosphere.

→ The two basic approaches to wildlife conservation

→ In protected habitats are
① In-situ Conservation
② Ex-situ Conservation

In-situ Conservation :

- It simply means conservation of species in its natural ecosystems as well as in manmade ecosystem.
- This strategy emphasizes protection of total ecosystem through network of protected area.
- Protected areas are area of land or sea especially dedicated to the protection and maintenance of include Biosphere reserves, National park, wildlife, sanctuaries etc.
- At present we have 14 major biosphere reserves 90 national parks, 448 wildlife sanctuaries in our country.

Ex-situ Conservation

- It is defined as the conservation of component of biological diversity outside their natural habitat.
- It involves maintenance and breeding of endangered plant and animal species under partially or wholly controlled condition etc.

→ Ex- Zoo, Botanical garden, Aquaria, Seed-bank, Cell bank, gene bank etc.

- There are more than 1500 botanical gardens in the world containing 80,000 species.
- There are more than 800 zoos around the world with about 3000 species of mammals, birds, reptiles and amphibians.

- Any [illegible] are [illegible] from time to time.
- Maintained facility for plant tissue culture Repository.
- Aseptic and sterile [illegible] [illegible]
- Maintained Diversity of plant genetic resources.
- It has been setup for the development of a facility of conservation of medicinal and rare plants/trees by tissue culture.

[illegible] : [illegible] [illegible]

[illegible] Kumar [illegible]

[illegible] [illegible]

Seminar: 8 [illegible]

Department of History of [illegible] Degree [illegible] organised a [illegible] [illegible] [illegible]

[illegible]

[illegible] Students Presenting Paper:

Paper Presented by: [illegible]

[illegible]

[illegible]

Chairman,

Student Attendance List

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. Aditi [illegible]
8. M. [illegible]
9. [illegible]
10.
11. [illegible]
12. [illegible]
13. [illegible]
14. [illegible]
15. [illegible]
16. [illegible]
17.
18. [illegible]
19. [illegible]
20. [illegible]
21. [illegible]
22. [illegible]

[illegible]

Golden rice

- Golden rice is a variety of Oryza sativa rice produced through genetic engineering
- Main purpose is to produce vitamin A
- Rice provides as much as 80 percent in some of the daily calorie intake of 3 billion people which is half of the world population
- Countries where [illegible] rice is a staple [illegible]. A British biotechnology [illegible] donated the licence to produce Syngenta [illegible] the [illegible] of British Royal Society of London
- Who bought the golden rice patent ?)
- Created in 1999 by Ingo Potrykus - Professor emeritus of the Institute for Plant Sciences
- Golden rice humanitarian board responsible for the public development and distribution of golden rice in the target countries

Effects of malnutrition

- Symptoms of vitamin A deficiency (VAD) include night blindness, increased susceptibility to infection and disease, chronic lack of tears (xerophthalmia) deterioration of the eye tissue and possible vascular disease
- Nearly a million children die from malnutrition each year
- A large proportion of these children die from common diseases that could have been avoided through adequate nutrition
- The reduced immune response increases the morbidity and mortality rates of children.

Mode task of works

→ The addition of two genes in the rice genome will complete the biosynthetic pathway :

→ 1. Phytoene synthase (psy) derived from daffodils (Narcissus pseudonarcissus)

→ Phytoene synthase is a transferase enzyme involved in the biosynthesis of carotenoids.

→ Carotenoids catalyses the conversion of geranylgeranyl pyrophosphate to phytoene.

→ 2. Phytoene desaturase (crt I) from soil bacterium Erwinia uredovora.

→ produces enzymes and catalyses for the biosynthesis of carotenoids β-carotene in the endosperm.

→ The psy and crt I genes were transformed into the rice nuclear genome and placed under the control of an endosperm-specific promoter so they expressed in the endosperm.

→ The exogenous lyc gene has a transit peptide sequence attached so it is targeted to the plastid where geranylgeranyl diphosphate formation occurs.

→ The bacterial crt I gene was an important inclusion to complete the pathway.

→ Since it can catalyse multiple steps in the synthesis of carotenoids, while these steps require more than one enzyme in plants.

→ The end product of the engineered pathway is lycopene, but if the plant accumulated lycopene, the rice would be red.

Advantage

- Golden rice give more quantity vitamin A
- Easy distribution when released to needy
- Cheaper option to supply vitamin A requirement compared to other supplementary measures.
- Sustainable option as once released for farmers cultivation can be cultivated every growing season by farmers saved seeds,
- therefore no need yearly budgetary investment for distribution.

Disadvantage

- Health
- May cause allergies or other problems adverse effect
- Supply doesnot provide a substantial quantity of the recommended daily intake.

Environment

- Loss of biodiversity, may become a prejudicial weed and endanger the existence of traditional rice plants.
- Genetic contamination of natural, global rice foods.

Culture

- Some people prefer to cultivate and eat only white rice based on traditional values and spiritual beliefs.

Source - Book, internet

Prasanta Kumar [illegible]
Asst. Pr. Botany

24

Seminar No. [illegible]

A Seminar on "Sectoral Distribution and Economic Development" organised by Department of Economics on 24. 08. [illegible] [illegible] by [illegible]

Name of the Resource Person :- Dr. [illegible]
H.O.D. of Economics
[illegible] College
[illegible]

Paper presented by :- 1. [illegible]
5th Sem (Major)
2. [illegible]
5th Sem
3. [illegible]
5th Sem
4. [illegible]

OFFICE OF THE PRINCIPAL [illegible]

N O T I C E

Date: [illegible]

It is informed to all the students of [illegible] Department to attend the Department Seminar Paper "Sectoral Distribution & Economic Development" on [illegible] at [illegible]

[illegible]

AGENDA

Departmental Seminar(06-11-2015) organised by Dept. of Economics

INAUGURAL SESSION

1.Lighting the candle by Principal,Guest and respective :

2.Garland to Lord Jagannath

3.Opening song by (Koyal Rani Bishoyi)

4. Introduction of Chief Guest, Chief Speaker and welcome address by - Smt.[illegible], Lecturer in Economics

5. Speech by President (Dr.[illegible])

SEMINAR SESSION

6. Paper presented by the students :

Mr.[illegible] (+3 1st Year Arts)
Mr.[illegible]Pradhan (+3 1st Year Arts)
Mr.[illegible] (+3 1st Year Arts)
Miss Koyal Rani Bishoyi (+3 1st Year Arts)
[illegible] (+3 1st Year Arts)

7.Paper presented by staff Members :-Smt.[illegible]
Lecturer in Eco.

8.Seminar topic by Chief Guest :-Dr.[illegible]

9.Seminar topic by Speech Speaker: Dr.[illegible] Chandra [illegible]

VALEDICTORY SESSION

10.Vote of thanks by: Smt.[illegible], Lecturer in Economics

Organizing Secretary

[illegible] 1st year [illegible]

[illegible] presentations ( )

[illegible] [illegible] { }

Sumita Sahu { }

5. Manas Behera

6. Mitu Behera

7. Lizan Devi

8. Angel Rani Giting

9. Pooja Rani Mohanty

10. [illegible] Modi

11. Uma Pradhan

12. Madhumita Reddy

13.

14.

[illegible] & Economic Growth

Introduction :-

During the British rule, Indian economy was a feudal economy. [illegible] political [illegible] was characterised by [illegible] and [illegible] the colonial [illegible] which was [illegible] the interest of [illegible] nations. The tillers were [illegible] landlords. As a result they had to pay heavy rent to the [illegible] on land. The farm products could [illegible] very low. [illegible] the productivity of land was [illegible] their [illegible] poverty and misery of [illegible]. During the times of Industrial Revolution British industrialists grew rapidly by using India as a cheap source of raw materials and as a market for their finished products. This led to the steady decline of our cottage and handicraft industries.

After independence, planning was accepted as a means to remove poverty, illiteracy and underdevelopment. Various schemes were implemented and Five year plans for the development of agriculture, industry, health, transport and communication etc. The architect of planning India [illegible] to the industrially development. Hence from the Second Five year plan, the process of rapid industrialisation was [illegible]. Till now we have completed 11 five year plans and Twelfth Five year plan is now in progress.

[illegible] of GDP

[illegible] the [illegible] sector [illegible]

[illegible] and [illegible] and protected [illegible] of primary sector.

[illegible] and trade of the primary [illegible] the [illegible] sector [illegible] rate of growth of [illegible] have been [illegible] have been included in the [illegible] Sector.

Growth Rate of Primary Sector :-

The Compound annual growth rate of India's GDP at factor cost by industry of origin from [illegible] to [illegible] shows that agriculture and allied activities [illegible] a slow rate of growth. The growth rate [illegible] a declining [illegible] and then rose to [illegible] per annum during [illegible] and [illegible]. Thus, the average growth rate of agriculture [illegible]

[illegible] of Economic [illegible]

[illegible] [illegible] [illegible] sectors :-

[illegible] of any country [illegible] economic activities the [illegible] sectors on the basis [illegible] broadly divided [illegible] sectors.

1) Primary Sector :-

Primary Sector [illegible] which exploits [illegible] is that sector of the natural resources. Agriculture, [illegible] mining, fishery, forestry and allied activities are included in this sector. Dairy, poultry etc are [illegible] [illegible] activities, primary

2) Secondary Sector :-

It is also called the manufacturing sector or industrial sector. The [illegible] is called the secondary sector. The manufacturing, electricity, gas, water supply etc are included in this sector.

3) Tertiary Sector :-

The tertiary sector of the economy is called the service sector. Services of various kinds like education, health, banking and insurance, trade and commerce are included in the tertiary sector. [illegible] [illegible] [illegible], the [illegible] [illegible] sector is [illegible] [illegible] [illegible]

[illegible] Sector :-

[illegible] of the remaining [illegible] manufacturing [illegible] to the [illegible] total growth rate [illegible] the first 10 years [illegible] by planning. But [illegible] of planned economy, the growth rate of industry [illegible] comparatively [illegible] Service sector plays a dominant [illegible] determining the growth rate of our GDP.

Growth Rate of Service Sector :-

The average growth rate in the Service sector during 1950-57 [illegible] per annum. During the first [illegible] years of planned economy growth rate increased to [illegible] from [illegible] [illegible] growth rate of the [illegible] sector indicates rapid growth of infrastructure and economy.

Contribution of different sectors to GDP :-

To study the structural change in any economy [illegible] analyse the contribution of different [illegible] sectors to the national output. From the [illegible] the changes in it show the nature of change in the pattern of specialisation.

Declining share of agriculture
Increasing contribution of industrial sector
Increasing contribution of service sector

Conclusion:-

From the above analysis of India's sectoral distribution of national income, we get a fair idea regarding the extent of change in the structure [illegible] in the process of development. The contribution of agriculture has declined and that of industry and service sectors has increased.

Seminar 2

A Departmental Seminar on "Gender Inequality and Women Empowerment" organized by Department of Economics on [illegible] Room no [illegible] by [illegible]

Name of the Organizing person — 1) Dr. [illegible]
[illegible] Economics Dept.
[illegible] College, [illegible]
2) [illegible]
[illegible] in Economics
[illegible] College

Paper presented by — 1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]

OFFICE OF THE PRINCIPAL, [illegible]

NOTICE

Date: [illegible]

It is informed to all the students of [illegible] to attend the Departmental Seminar

Topic :- "Gender Inequality & Women Empowerment" on [illegible] At [illegible] in room no [illegible]

[illegible]

AGENDA

Department of Seminar on [illegible]-09-2016 organized by Dept of Economics

INAUGURAL SESSION

1. Lighting the candle by Principal Guest and respective ...

2. [illegible] Lord Jagannath

3. [illegible] Song by (Royal Rani Bishoyi)

4. Introduction of Chief Guest, Chief Speaker and welcoming address by Smt [illegible] Das, Lecturer in Economics

5. Speech by President : Dr [illegible]

TECHNICAL SESSION

6. Paper presented by the students :

Mr. [illegible] , +2 2nd Year Arts
Mr Ramakrushna Pradhan , +2 2nd Year Arts
Mr. [illegible] , +2 2nd Year Arts
Miss Royal Rani Bishoyi , +2 2nd Year Arts
Mr. Gouri Shankar Sahu , +3 1st year Arts
Mr. [illegible] , +3 1st year Arts
Mr. Chinmaya [illegible] , +3 1st year Arts

7. Paper presented by Staff Members : [illegible]
Lecturer in Econ

8. Seminar topic by Chief Guest : Dr [illegible], Reader

9. Seminar topic by Speech Speaker : Mr Prabhanjan Panda, Lecturer

VALEDICTORY SESSION

10. Vote of thanks by : Smt [illegible] Das , Lecturer in Economics

Organizing Secretary

Department Of Economics
Semin Date:-06.09.2016

Department Of Economics

GENDER EQUALITY AND WOMEN EMPOWERMENT
IN ODISHA

Introduction :-

Women's empowerment and gender equality have been recognised as key principles not only to the wellbeing of nations, but also to social and economic development. Gender inequality exists in all societies and at all levels of society. There is sharp decline in female employment in the last decade at national and sub-national level.

What is gender equality :-

Gender equality means that the different behaviour, aspirations and needs of women and men are considered, valued and favoured equally. It doesn't mean that women and men have to become the same, but that their rights, responsibilities and opportunities will not depend on whether they are born male or female.

What is gender inequality :-

It is the idea and situation that women and men are not equal. Gender inequality refers to unequal treatment or perception of individuals wholly or partly due to their gender. It arises from differences in gender roles.

men Empowerment :-

Empowerment refers to increasing the spiritual, tical, social and economic strength of individuals nd communities. It often involves the empowered veloping confidence in their own capacities. It is process that fosters power in people for use in their own lives, their communities and their society by acting on issues that they define as important.

Women empowerment is the process in which women elaborate and recreate what is it that they can be, do and accomplish in a circumstance that they previously were denied. Women empowerment has become a significant topic of discussion in development and economics.

Main objectives of women empowerment :-

1) Enhancing women's voice in decision-making, leadership and peace-building.
2) Promoting women's economic empowerment
3) Ending violence against women & girls

Methods of Empowerment :-

a) Economic empowerment
b) Political empowerment
c) Educational empowerment
d) Social empowerment

Women Empowerment in Odisha

The Government of Odisha has implemented the welfare schemes framed by Government of India as well as the State has been giving all the equality to the women as per the Constitution of India, but still it has been observed that women are not able to reach to the mainstream of the society. So the State felt the need that equality to women is not enough, they should take the initiative to justify the empowerment. In Odisha also various governmental scheme are implemented by the State Govt. Such as:-

1. Mission Shakti on 1st Mar 2001 (to empower the women through SHG)
2. Mamata Yojana
3. [illegible] Yojana etc.

Mission Shakti :-

It is well known that economic empowerment of women significantly contributes to their social empowerment. As such helping women to achieve economic independence by enabling them to have independent employment and income has been accorded the highest priority. Formation of women's elf Help Groups (WSHGs) has therefore been ified as a Key strategy for achieving women's powerment. For upliftment of WSHGs ferent schemes like Micro Credit Support, d Money, Financial Assistance to BIF and [illegible] Revolving were completed.

Activities of Mission Shakti :-

1. Formulation, gradation and promotion of Self-Help Groups.
2. Establishment of Bank Linkage of WSHGs.
3. Financial Assistance to WSHGs
4. Imparting Training for complete Management of WSHGs.
5. Strengthening and capacity building training to WSHGs.
6. Conducting Exposure visits to WSHGs.
7. Skill based Training, Market Linkage and Credit Linkage based on IGA activities.
8. Production, Promotion & Marketing of products of WSHGs.

powerment of Women through (SHGs) :-

The SHG in our Country has become a Source of inspiration for women and their welfare. Formation of SHGs is certainly a viable alternative for achieving the objectives of rural development programmes. SHGs is a small voluntary association to form a group. It is an informal & homogeneous group consisting of not more than twenty members. The numbers has been thought to be desirable. SHG is made to avoid legal complications for registration. It is recommended to be informal to keep them away from bureaucracy, corruption, unnecessary administrative expenditure and profit motive. The purpose of making it informal is to provide a healthy atmosphere and better, collective work for poverty reduction which simultaneously enables to improve & shape the lives of its members in a better way.

Conclusion :-

It is suggested that women realise that empowerment is a state of being as well as state of mind & before full empowerment can be realised, women need to not only act differently but also to think differently, to value themselves more and to equally really believe that they are equal.

Seminar 4 Dt. - 29.09.21

A Departmental Seminar on "Poverty in India"
Organised by Department of Economics on dated
29.09.2021 Room No. 112 by 11.30 A.M.

Name of the Resource Persons :-
1. Shri Jana Mani Sahu
Lecturer in Economics

Paper Presented by :- 1. Laxmi Kanta Bhakta
+3 3rd Arts
2. Suman Badatya
3. Chinmayi Behera +3 2nd Yr Arts
4. T. Dhanamani

OFFICE OF THE PRINCIPAL, [illegible] MAHAVIDYALAYA, [illegible]

NOTICE

Date: 23.09.2021

It is informed to all the students of +3 Economics Honours to attend the Departmental Seminar [illegible] on 29.09.2021 at 11.30 A.M. in room no. 112

Seminar Secretary

AGENDA

Departmental Seminar ([illegible]) organized by Department of Economics

INAUGURAL SESSION

1. Lighting the candle by Principal, Guest, and respective
2. Garland to Lord Jagannath
3. Opening song by :- Epsita Sahu
4. Introduction of Chief Guest, Chief Speaker and welcoming address by- Smt Nutana Das, Lecturer in Economics
5. Speech by President :- Sri Raghunath Nayak Principal

SEMINAR SESSION

6. Paper presented by the student :-
    a. Mr. Laxmikanta Dhalabhai, +3 final yr
    b. Suman Badaiya +3 final Yr
    c. Chumuki Behera +3 2nd Yr
    d. J. Dharmendra +3 2nd Yr
7. Paper Presented by staff member :- Nutana Das Lecturer In Economics
8. Seminar topic by Chief Guest :- Sri Jenamani Sahu Lecturer in Economics
9. Votes of thanks by :- Smt Nutana Das Lecturer in Economics

Organizing Secretary

1) [illegible] Bhaduri
2) [illegible]
3) Sanchita Kumari Prasad
4) Epsita Saha
5) [illegible]
6) Gyanmoni [illegible] Bhuiya
7) [illegible]
8) [illegible]
9) [illegible] Saha
10) [illegible]
11) [illegible]
12) [illegible]
13) [illegible] Prasad
14. [illegible] Prasad 19th Jan
15. [illegible] Ahmed
16. [illegible]
17. [illegible]
18. [illegible]
19. Jishu [illegible]
20. [illegible]
21. [illegible]
22. [illegible]


DEPARTMENT OF ECONOMICS

POVERTY IN INDIA

Poverty:-

India is a poor country, poverty is one of the basic characteristics of the Indian economy. Inspite of the spectacular development in science and technology, it is distressing to see hunger, illness and deprivation among more than one third of our total population.

Poverty is a curse. The greatest curse is that it is self-perpetuating in character. "[illegible] [illegible] it is considered, bother for the people and the country.

Meaning of poverty:-

poverty is defined as "the deprivation from the minimum consumption requirement necessary to keep a person alive and active. In other words, when a person is unable to secure the basic necessities of life like the minimum of food, clothing, shelter necessary for his bare existence, he is treated as to be poor.

Generally economists employ two concepts to measure the extent of poverty, viz. (i) absolute poverty and (ii) relative poverty. Let us analyse and understand the two concepts in order to know what poverty exactly means.

Absolute poverty - Absolute poverty is defined as "the inability to obtain the minimum standard of consumption necessary for man's bare existence." Failure to get the minimum consumption requirement like minimum of food, clothing, shelter is termed as absolute poverty.

Relative poverty:- "Relative poverty is said to exist when the consumption standard of one person lies behind the consumption standard of the other." It is thus a reflection of inequality in the living standards of the people reflected in the inequality of income distribution.

In India, we are concerned with the problem of absolute poverty. So it is well understood that the study of relative poverty becomes redundant.

Poverty line:-

The concept of poverty line is used by the economists and policy makers to measure the extent of poverty in the country.

Meaning:-

Poverty line is expressed in terms of the minimum expenditure level as determined by the per capita calorie consumption. In India, poverty line is defined as "the monetary expenditure needed to obtain the daily per capita intake of 2400 calories in rural areas and 2100 calories in urban areas."

Causes of poverty:-

From the above discussion, it is clear that the problem of poverty in India is very vast and dreadful. When we think of eradication of poverty in India, we ought to find out its causes. It will help us to devise suitable policy measures for poverty alleviation programmes.

1. Slow rate of economic growth:-

In India slow rate of economic growth is one of the most important factors.

responsible for mass poverty. Till 1980, the rate of economic growth was very slow, i.e. 3.5 per cent per annum. This resulted in higher poverty ratio. If the rate of economic growth is low there is nothing to distribute but to distribute poverty.

2. Rapid growth of population:-

Rapid growth of population is another cause of poverty and unemployment in India. Rapid population growth necessitates higher "demographic investment" to maintain the existing level of per capita income. This checks the "economic investment" which raises per capita income. Therefore in any programme of poverty eradication, there is no escape route on population control.

3. Back-wash effects of development.
4. Unequal distribution of wealth and income
5. Unemployment and Underemployment.
6. Backward agriculture
7. Neglect of small scale and cottage industries
8. Leakages of funds for anti-poverty programmes
9. Social factors
10. political factors

Poverty alleviation programmes:-

1. Integrated Rural Development programme (IRDP)
2. National Rural Employment programme (NREP)
3. Rural Landless Employment Guarantee programme (RLEGP)

4. Training of Rural youth for Self Employment (TRYS
5. Jawahar Rozgar Yojana (JRY).
6. Indira Awas Yojana.
7. Million Wells Scheme (MWS)
8. Development of women and children in Rural Areas (DWCRA)
9. Ganga Kalyan Yojana (GKY)
10. Employment Assurance Scheme (EAS)
11. The Swarnajayanti Shahari Rozgar Yojana.
12. Prime Minister's Rozgar Yojana (PMRY)
13. Jawahar Gram Samridhi Yojana (JGSY).
14. Sampoorna Grameen Rozgar Yojana (SGRY).
15. Swarnajayanti Gram Swarozgar Yojana (SGSY).
16. Mahatma Gandhi National Rural Employment Guarantee Scheme.

[illegible]

NOTICE

[illegible]

AGENDA

ORGANISED SEMINAR (DEPT. OF PHYSICS) Date-16/11/2018

INAUGURAL SESSION

1. Lighting the candle by Principal,Guest and respective :-

2. Garland to Lord Jagannath [illegible]

3. Opening song by : Miss Bhabani Maharana & Deepti Rani Sahu

4. Introduction of Chief Guest, Chief Speaker and welcoming

address by Sri Ranjit Kumar,Dept.Physics.

5. Speech by President : Sri Raghunath Nayak

SEMINAR SESSION

6. Paper presented by the students :-

Miss.Bhabani Maharana,+3 3rd yr.
Miss Monisha Panigrahy,+3 3rd yr.
Miss Deepti Rani Sahu,+3 2nd yr.
Miss Lisa Rani Patra,+3 2nd yr.

7. Paper presented by staff Members :-

Sri Ranjit Kumar Sethi,Dept.Physics.

8. Seminar topic by Chief Guest :- Sri Balaji Panda, Dept.Physics.

9. Seminar topic by Speech Speaker:

Sri Bhabani Panigrahy, Dept.Physics.

VALEDICTORY SESSION

10.Vote of thanks by :- Sri Ranjit Kumar Sethi,Dept.Physics

Organising Secretary

[illegible] [illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]
11. [illegible]
12. [illegible]
13. Dev [illegible]
14. [illegible]
15. [illegible]
16. [illegible]


physics Seminar

(Superconductivity)

Historical Introduction

In 2011, the world celebrated hundred years of the discovery of superconductivity. It was discovered by a Dutch scientist named Heike Onnes in 1911 when he cooled the solid mercury and its electrical resistance completely vanished at 4.2 K. Later some other materials and alloys were also found to be superconductors. The temperature at which the material becomes a superconductor is called the transition temperature. At high temperature superconductivity vanishes because thermal fluctuations destroy the pairs. [illegible] [illegible] attractive interaction between pairs of electrons mediated by phonons, which are the quanta of lattice vibrations in a crystal. Superconductivity is also destroyed by high magnetic fields and high current density.

Another important aspect of superconductivity is Meissner effect. It was discovered by Walther Meissner and Robert Ochsenfeld in 1933. When a superconductor is cooled from the normal state to the superconducting state in an external magnetic field, the magnetic lines of force are expelled out of the material. In other words, the magnetic induction becomes zero in the superconducting state. This is an independent signature of the superconducting state and does not follow from the zero resistance state. Then [illegible] [illegible] that a superconductor is a perfect diamagnet.

About two years later in 1935, brothers Fritz and Heinz London showed that the current density in a superconductor is proportional to the magnetic vector potential. The Meissner effect follows from the London equation. Thus their work explained how superconductors interact with static magnetic field. The latest experimental observations written in the discontinuity in the specific heat at the critical temperature, thus identifying the transition as second order and the isotope effect by Emanuel Maxwell, which related the critical temp. of the ions to the isotopic composition. The latter led to the notion that phonons could play a role in the understanding of the mechanism of superconductivity.

Finally, the breakthrough came in 1957, in the form of John Bardeen, Leon Cooper and James Schrieffer publishing their work on the mechanism of Superconductivity, explaining the concept of Cooper pair formed by electrons of opposite spins and opposite momenta by taking phonons or lattice vibrations into account. The theory of BCS explained all the experimentally observed phenomena. As a result, the three were awarded Nobel Prize in Physics in 1972.

The story is taken further in 1962, a graduate student Brian Josephson of the University of Cambridge, U.K., published a work on tunnelling of Cooper pairs through superconductors to [illegible], separated by a thin insulating barrier. This work was opposed by Bardeen who said that there could not be any such tunnelling because the pairs would be lost in the insulating barrier. However, as per quantum theory, although the bias would be zero, the pair conduction amplitude would not be zero. Thus there is no resistance for pair tunnelling across the insulating barrier. This also won Nobel Prize in Physics for Josephson in 1973.

Apart from metals and metallic alloys, superconductivity was observed in a variety of materials, such as degenerate semiconductors, one dimensional organic conductors, heavy fermion systems and fullerenes. The latter compounds are those obtained upon intercalating carbon molecules. The transition temperatures were not very attractive in these systems.

In 1986 there was a breakthrough when J Georg Bednorz and Alexander Müller observed superconductivity in a compound of La Ba Cu O at a transition temperature of about 30K. Although the temperature was not very high, it was observed in an unusual ceramic compound which till then was regarded as insulator. Thereafter the transition temperature showed up a staggering rise. Soon we find that the transition temperature crossed the liquid nitrogen temperature of 77K. Soon several compounds were found in this kind of category and till [illegible] the highest transition temperature is recorded at about 135K in $HgBa_2Ca_2Cu_3O_8$. Bednorz and Müller were awarded Nobel Prize in Physics in 1987 for such discovery. This is due to the dedicated investigations in this field of [illegible].

The following who were Nobel awarded, were Alexei A. Abrikosov and Vitaly Ginzburg [illegible] awarded Nobel Prize in 2003 for their work in superconductors. Lev Landau (1962) and Pyotr Kapitsa (1978) were awarded Nobel Prize for their work in superfluidity and low temperature physics.

In the meantime superconductivity was discovered in MgB_2 and Iron based compounds. Despite tremendous work, there has been no consensus on a satisfactory mechanism to explain the occurrence of high T_c superconductivity. This is still a wide open subject. The search for room temperature superconductivity continues. Recently there could be commercial applications due to superconductors.

Occurrence of superconductivity

a. Zero resistivity and transition temperature

As mentioned earlier, superconductivity was first discovered in mercury. Prior to this discovery, Onnes discovered that helium liquefies at 4.2K. He was conducting measurements on electrical resistivity [illegible] that the resistivity of mercury dropped down to zero at 4.2K. Absence of the [illegible] it [illegible] the same results. The phenomenon was named as superconducting. Later, on discovering that some other metals also showed the same phenomenon, but at different temperatures. The temperature at which the resistivity of a metal becomes zero is its superconducting transition temperature T_c. Subsequently, it was found that not only metals but also the metallic alloys, semiconductors, organic conductors, and rare earth based compounds show superconductivity below their respective transition temperature. For a superconductor, the property is retained for $T<T_c$, and the material becomes a normal conductor above T_c. In the table 11.1, we give a list of superconductors with their respective transition temperatures.

2. Meissner effect

When a superconductor is cooled through T_c in the presence of magnetic field, the magnetic lines of force, which pass through the solid abruptly, disappear totally. In other words, the magnetic induction $\vec{B}$ is zero inside the solid in the superconducting state. This situation is shown in Fig 11.1

Fig 11.1 (a) A superconductor above T_c in the presence of a magnetic field $\vec{B}$. (b) the super [illegible]

below T_c we have $\vec{B} = \mu_0(\vec{H} + \vec{M}) = 0$. The magnetic susceptibility χ is the ratio of $\vec{M}$ to $\vec{H}$. For a typical diamagnetic, χ is of the order of 10^{-6}. Thus a superconductor behaves like a perfect diamagnet [illegible] when current flows we have $\rho J = E$. As $\rho = 0$ and $J \neq 0$, then $E = 0$ inside; from Maxwell's equation, $\nabla \times E = -\frac{1}{c}\frac{\partial B}{\partial t}$, B is constant w.r.t. t, which violates Meissner effect. Thus Meissner effect does not follow when current flows. In other words, Meissner effect is independent of zero resistivity of the superconductor.

C. Type I and Type II superconductors

Superconductors which expel the magnetic field completely are type-I superconductors. Here the magnetization is directly proportional to the magnetic field upto H_c (see Fig. 13.1). H_c is the critical magnetic field; the significance of this field is that superconductivity is retained as long as $H < H_c$ and beyond the material becomes a normal conductor. The critical field is a function of temperature and is given by

$$H_c(T) = H_c(0)\left[1 - \frac{T^2}{T_c^2}\right]$$

where $H_c(0)$ is the value of $H_c(T)$ at 0K. The critical field is plotted as a function of T in Fig 13.2.

Fig. 13.2 The critical field is plotted as a function of temperature

Just as there is a critical temperature, there is a critical magnetic field. There is another critical parameter, the critical current density J_c. Superconductivity is lost if $J > J_c$, where J is the current density. The magnetization versus magnetic field plot for type II superconductors is shown in Fig 13.3.

Fig. 11.11: Illustration of [illegible] effect. The magnetisation is proportional to H until H_c. The [illegible] S and N represent respectively, superconducting and normal conducting states.

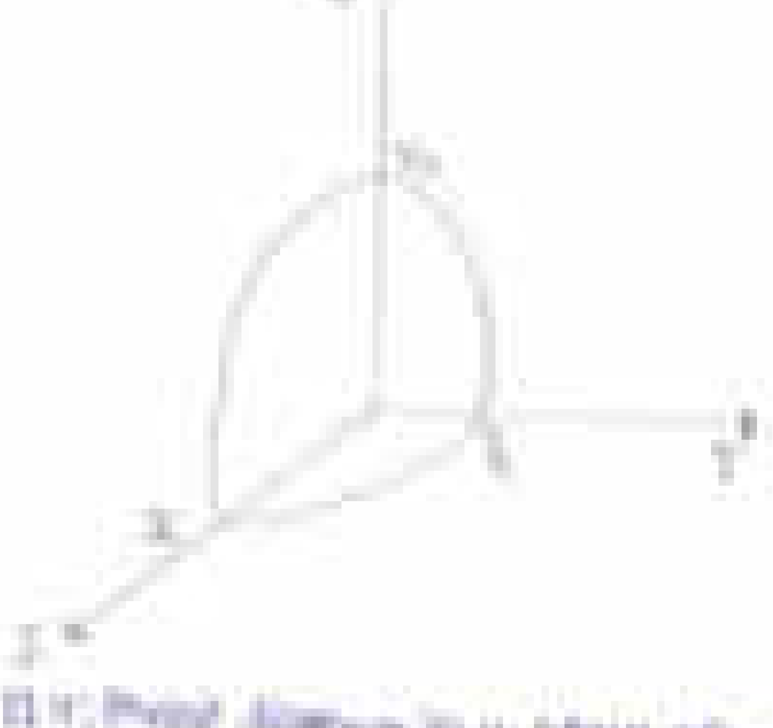


Fig. 11.12: Phase diagram in a space spanned by T, H and J. Within the closed shape bounded by the parameters T_c, H_c & J_c, the state is superconducting and beyond, normal.

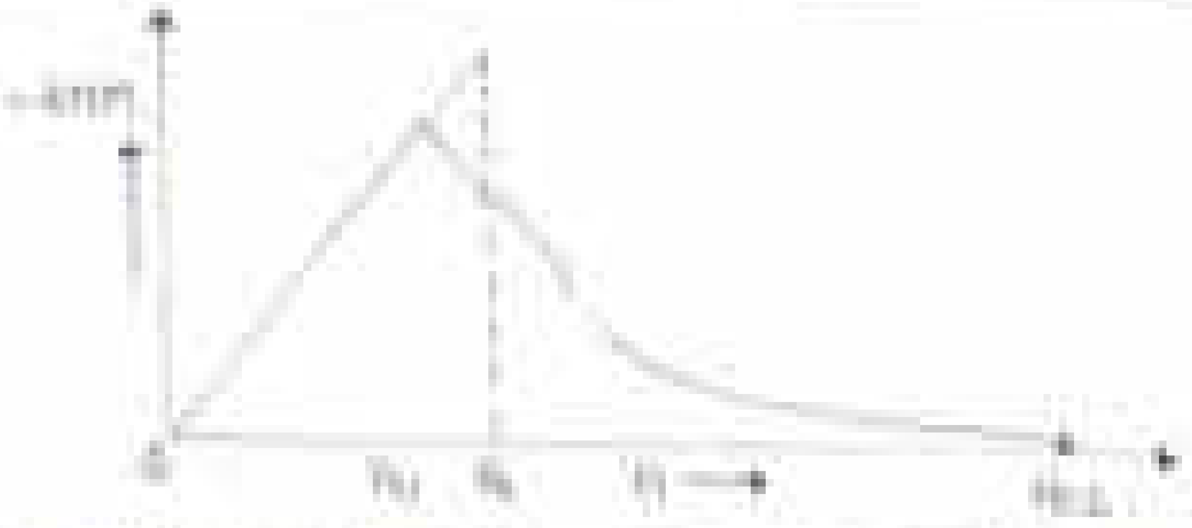


Fig. 11.4: Magnetization versus magnetic field in perfect type II superconductor having the two critical magnetic fields, H_{c1} and H_{c2}.

While, it is a normal conductor. However, for $H_{c1} < H < H_{c2}$, the material has a mixed state in which the magnetic field lines enter the material, and hence it does show superconductivity with respect to magnetic materials. However, the resistivity (ρ) still is zero. In other words, the superconducting property with respect to electrical property is retained. If the specimen is in cylindrical shape, the mixed state represents a superconducting cylinder while penetrating the magnetic flux lines as shown in Fig. 11.5.

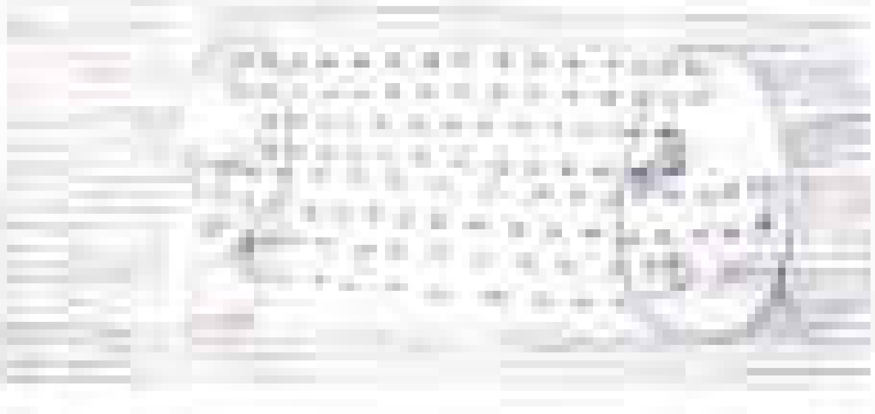


Fig. 11.5: Vortex lines (magnetic lines of force) in the mixed state

D. Josephson effect

In 1962, Brian David Josephson discovered the Josephson effect, which is given by the relation $h\nu = 2eV$.

where M is the isotopic mass of the superconducting element, α is ½ power. The theoretical value of α is 0.5. The discrepancy led to the idea that the mechanism of superconductivity may involve phonons. The observed values of α are close to this value for most of the elemental superconductors.

4. Superconducting gap

The BCS mechanism of a superconductivity involves an attractive interaction between two electrons, mediated by phonons. Because of this interaction a gap opens up at the Fermi surface, meaning that the superconducting ground state is separated by a gap from the excited state. The gap vanishes at $T = T_c$. The gap is a function of T and is given by

$$\Delta(T) = \Delta(0)\left[1 - \frac{T}{T_c}\right]^{1/2}$$

where $\Delta(0)$ is its value at $T \to 0$. The gap is plotted as a function of temperature in Fig. 11.4.

Fig. 11.4: The superconducting gap is plotted as a function of temperature. The gap vanishes at $T = T_c$. This is a phase diagram separating the superconducting phase from the normal phase.

5. Specific heat of superconductors.

The specific heat below the T_c behaves as a function of T exponentially and is proportional to $e^{-\Delta/kT}$, as is shown in Fig. 11.5. Explain the jump shown in the specific heat.

Fig. 11.5 The variation of the specific heat of a superconductor with T.

11.5 THERMODYNAMICS OF SUPERCONDUCTING PHASE TRANSITION

In this section we shall discuss the thermodynamics of the superconducting phase transition by analysing the free energy, entropy and the specific heat in both in the phases. The Gibbs free energy G for the thermodynamic system in the presence of an applied magnetic field H is given by

$$G = U - TS - MH \qquad (11.3)$$

where U is the internal energy, S entropy and M is the magnetisation. The change in the free energy is

$$dG = dU - TdS - SdT - MdH - HdM \qquad (11.4)$$

and the change in the internal energy is

$$dU = TdS + HdM \qquad (11.5)$$

Substitution of eq (11.5) in eq (11.4) yields

$$dG = -SdT - MdH \qquad (11.6)$$

It is a general equation and will now be considered separately for normal and superconducting state.

Normal State:

In the normal state, $M = 0$, at constant temperature,

$$dG_n(T,H) = 0 \qquad (11.17)$$

where G_n is the normal state free energy. Integrating both sides, we have $G_n(T,H) = G_n(T,0)$ (11.18)

implying the field independence of G_n.

Superconducting State:

In the superconducting state, at constant temperature, eq. (11.16) becomes, using $M = -\frac{H}{4\pi}$, $dG_s = \frac{1}{4\pi} H\,dH$ (11.19)

where the subscript s stands for the superconducting state. Integrating both sides, we have $G_s(T,H) = G_s(T,0) + \frac{H^2}{8\pi}$

At the critical field, H_c,

$G_n(T,H_c) = G_s(T,H_c) = G_n(T,0)$

Using eq. (11.17) & (11.19), we have

$G_n(T,0) = G_s(T,0) + \frac{H_c^2}{8\pi}$

Thus at critical magnetic field, the free energy of the superconducting state is increased to that of the normal state, implying the stability of the phases with the same. A plot of $G_s(T,H)$ as a function of H is shown in fig (11.4).

Fig 4.8 shows changes in the superconducting and normal states. In the superconducting state the free energy varies quadratically with the magnetic field up to H_c and is constant in the normal state.

Entropy

At the critical magnetic field, the change of the superconducting state to the normal state thus we have $dG_s = dG_n$. From eq. (11.4), we have

$$-S_s dT = -S_n dT + \frac{H_c}{4\pi} dH_c \qquad (11.8)$$

leading to

$$S_n - S_s = \frac{H_c}{4\pi}\frac{dH_c}{dT} \qquad (11.9)$$

From eq. (11.9) it is readily seen that the differential quantity is negative meaning that $S_n > S_s$. Since entropy denotes disorder, the superconducting state is more ordered than the normal state.

Differentiating eq. (11.9) with respect to temperature at constant field and multiplying by T on both sides, we obtain

$$T\left(\frac{\partial S_s}{\partial T}\right) - T\left(\frac{\partial S_N}{\partial T}\right) = \frac{T}{4\pi}\frac{\partial}{\partial T}\left[H_c\frac{dH_c}{dT}\right] \quad (11.15)$$

$$\text{or } C_s - C_N = \frac{T}{4\pi}\left[\left(\frac{dH_c}{dT}\right)^2 + H_c\frac{d^2H_c}{dT^2}\right]$$

where C_s and C_N are the specific heats of the superconducting and the normal states respectively. At $T = T_c$, $H_c = 0$ so the second term vanishes giving

$$C_s - C_N = \frac{T_c}{4\pi}\left(\frac{dH_c}{dT}\right)^2_{T_c} \quad (11.16)$$

and we see a finite discontinuity between C_s and C_N as shown in Fig 11.5. Thus the transition from superconducting state to the normal state is second order.

11.4 ELECTRODYNAMICS: LONDON EQUATIONS

We have seen from (11.1a) that zero resistance together with the Maxwell's equation $\nabla\times\vec{E} = -\frac{1}{c}\frac{\partial\vec{B}}{\partial t}$ does not give Meissner effect. Since we do not change the Maxwell's equation, we look for an alternative expression for the current density. In 1935 F. London and H. London proposed that the current density in a superconductor is given by

$$\vec{J} = -\frac{c}{4\pi\lambda_L^2}\vec{A}(\vec{r}) \quad (11.17)$$

where $\vec{A}$ is the magnetic vector potential. λ_L is now known as the London penetration depth. Before [illegible] this [illegible] an expression for J, we shall [illegible]

The current density for an electron gas is given by

$\vec{J} = -ne\vec{v}$

where n is the concentration of electrons. From Lorentz force, we have $m\dot{\vec{v}} = -e\vec{E}$. Substitution of this in eq (11.18) leads to $\dot{\vec{J}} = \frac{ne^2}{m}\vec{E}$. Taking curl of both sides and using the electromagnetic Maxwell equation, we obtain

$$\nabla\times\dot{\vec{J}} = -\frac{ne^2}{mc}\frac{d\vec{B}}{dt} = -\frac{ne^2}{mc}\frac{d}{dt}(\mu\vec{H}) \qquad (11.19)$$

Changing the order of differentiation in the left hand side of Eq. (11.19), we have

$$\frac{d}{dt}\left[\nabla\times\left\{\vec{J}+\frac{ne^2}{mc}\vec{H}\right\}\right]=0 \qquad (11.20)$$

which leads to

$$\nabla\times\left\{\vec{J}+\frac{ne^2}{mc}\vec{H}\right\} = \text{const} \qquad (11.21)$$

from which we obtain

$$\nabla\times\vec{J}+\frac{ne^2}{mc}\vec{H} = 0, \Rightarrow \nabla\times\vec{J} = -\frac{ne^2}{mc}\vec{H} \qquad (11.22)$$

From Eqs. (11.19) and (11.22), we obtain an expression for the λ as

$$\lambda_L = \sqrt{\frac{mc^2}{4\pi ne^2}} \qquad (11.23)$$

In order to understand the meaning of λ and the Meissner effect, we consider the following Maxwell's equation,

$$\nabla\times\vec{H} = \frac{4\pi}{c}\vec{J} + \frac{d\vec{D}}{dt} \qquad (11.24)$$

where $\vec{D}$ is the displacement vector and for non magnetic material, $\vec{B} = \vec{H}$. In steady state, the time involving the time derivative vanishes and we have

$$\nabla\times\vec{H} = \frac{4\pi}{c}\vec{J} \qquad (11.25)$$

Taking curl on both sides and using the (11.17) we have

$$\nabla^2 \vec{H} = \frac{1}{\lambda_L^2} \vec{H} \qquad (11.19)$$

which, in one dimension, becomes

$$\frac{d^2 H}{dx^2} = \frac{1}{\lambda_L^2} H, \qquad (11.2a)$$

which, when solved gives

$$H(x) = H(0) e^{-\frac{x}{\lambda_L}} \qquad (11.2b)$$

The magnetic field decreases as a function of x. λ_L is the range of the magnetic field penetration in the superconducting specimen. It has been estimated to be equal to ~ 10^{-6} cm. We shall see that in a superconductor, the flux is quantized, and H(x) decays as a function of x in a quantized way. Figure. Thus we obtain exponential decay from London's equation

Fig 11.4: The magnetic flux in a superconductor is quantized if we consider a cylindrical specimen.

COHERENCE LENGTH

Another length scale was introduced by Pippard & Faber. we have seen in the preceding section and the London equation is a local equation. Pippard's coherence length is a measure of the extent of the nonlocal integration of the magnetic vector potential to obtain an average value of the current density in London's equation. It is also a measure of the thickness of the transition layer between the normal state and the superconducting state.

Since superconducting electron pairs which remain within energy range of Δ near the Fermi surface are affected

$$\varepsilon_k = \frac{\hbar^2 k^2}{2m} \leq \varepsilon_F + \Delta$$

Here Δ is the measure of the superconducting gap. Suppose the state of the system is perturbed by $k \to k_F + \delta k$, where δk is an infinitesimal change in the wave vector. Neglecting the second order terms in δk, the change in energy becomes $\frac{\hbar^2 k_F \delta k}{m}$. So the superconducting state would be stable if this change does not exceed Δ. Thus substituting δk for ξ_0 we obtain the coherence length ξ_0 as

$$\xi_0 = \frac{1}{\delta k} = \frac{\hbar^2 k_F}{m\Delta} = \frac{\hbar v_F}{\Delta}$$

Problem: Obtain Eq (?.?) by modulating the plane wave function e^{ikx} by $\frac{1}{\sqrt{2}}\left(e^{ikx} + e^{i(k+q)x}\right)$ and equating the change in energy to Δ.

QUALITATIVE ASPECTS OF BCS THEORY

A convincing theory of superconductivity was developed by John Bardeen, Leon Cooper and J. R. Schrieffer in [illegible] [illegible] in physics [illegible] Bardeen, J. Cooper, L. N., Schrieffer, J. R. [illegible] [illegible] [illegible] [illegible] (BCS). [illegible] [illegible] [illegible] [illegible], [illegible] [illegible] [illegible] [illegible] in explaining the conventional materials was [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

1. Superconductivity occurs due to an attractive interaction between two electrons mediated by a phonon. The idea [illegible] [illegible] [illegible] [illegible] (Cooper pair) [illegible] [illegible] by [illegible] charge among [illegible] [illegible], which [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] electrons [illegible] [illegible] [illegible].

2. The two electrons in a Cooper pair [illegible] [illegible] [illegible] that these electrons have opposite spins and opposite momenta and are represented by $(\vec{k}\uparrow, -\vec{k}\downarrow)$ [illegible] [illegible] [illegible] [illegible] the pair has a spin-singlet state and zero momentum. Thus, the pair has [illegible] and total momentum [illegible] a [illegible].

Fig. [illegible] (a) The [illegible] [illegible] of a superconductor [illegible] electrons [illegible] [illegible] [illegible] [illegible] [illegible] (b) [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

3. BCS conclusion is the following: the ground state of the system is separated and insulated from the excited states by an energy gap of magnitude 2Δ, as shown in Fig 11.5(a)

Fig. 11.5 (a) shows the binding energy gap versus temperature T and (b) represents the superconducting and normal phases respectively. At first it might appear that the superconducting state has higher energy because in the excited state above the Fermi level. The increase in energy is, however, more than compensated when the binding between two electrons occurs. The superconducting energy gap is given by

$$E_g = 3.52k_BT_c\left(1-\frac{T}{T_c}\right)^{1/2}$$

It describes a phase transition, Fig 11.5(a). At T = 0K, the gap has the width of k_BT_c.

4. Following the description of a rigorous theory in a brief section, we shall now focus on the accomplishments of the theory. The theory explains most of the characteristics observed in the conventional superconductors, such as the Meissner effect, London equation and coherence length

which results in natural consequences of the theory.

5. The superconducting transition temperature is found to be

$$T_c = 1.14\,\theta_D\, e^{-1/UD(E_F)}$$

where θ_D is the Debye temperature, U the attractive electron interaction and $D(E_F)$ is the density of states. On the [illegible] metals which have large resistivity at room temperature are found to be having higher T_c.

6. Flux quantisation also follows as a natural consequence of the theory and the effective unit of charge is 2e but [illegible] some of these [illegible].

TUNNELLING PHENOMENON IN SUPERCONDUCTORS

In this section we shall discuss tunnelling phenomena in some conductors, [illegible] Josephson junctions; we have previously discussed tunnelling in semiconductor junctions, the tunnel diode. Here we shall consider what happens if two metals are separated by thin insulating barriers, [illegible] [illegible] us to consider the situation of two metals M1 and M2 separated by a thin insulating barrier. (fig 4.?)

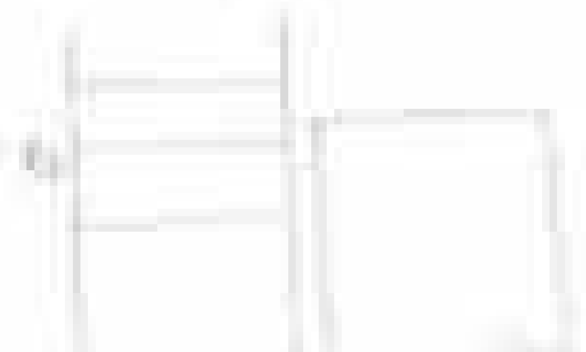
Fig. 4.?: Two metal junction, separated by a thin insulating barrier.

The metals describe by their [illegible] of Fermi levels, [illegible] the levels which are occupied in M1 and M2 [illegible]. Because of the [illegible] [illegible], the [illegible] is [illegible]

Now suppose we now set its current to a voltage source, the junction from [illegible] will transfer to [illegible], until equilibrium is reached, equalising the fermi levels on both sides of the junction. The tunneling current I, which flows against the voltage shows an ohmic behaviour.

Giaever Tunnelling

We shall now consider a junction of a superconductor and a normal metal separated by a thin insulating barrier. The situation is shown in Fig. 11.12(a). The junction is connected to a voltage source. As long as the voltage is less than the threshold voltage, V_c, there is no current flow from the superconducting region on to the normal region. At V_c, the energy becomes $2eV_c$, $2e$ being the charge on a cooper pair. At this energy the cooper pairs are broken and there would be some electrons in the excited state of the superconductor. These electrons would tunnel through the barrier. This Giaever's single particle tunneling phenomenon can be used for the experimental determination of Δ the superconducting gap. The I versus V curve is shown in Fig. 11.12(b).



(a)

(b)

Fig. 11.13(a) A junction of a superconductor S and metal M. These are separated by a thin insulating barrier. The Fermi level of the metal is at the middle of the superconductor gap. In the applied voltage level to (b) the current versus voltage curve. For V < Δ the current is almost zero; at V ≈ Δ the current suddenly rises because of the tunnelling process and subsequent tunnelling electrons from S side to M side. For V > Δ, the current follows a linear relation.

JOSEPHSON TUNNELLING

B.D. Josephson showed that if one forms a junction of two superconductors separated by a thin insulating barrier, one would observe the following effects.

DC effect: In the absence of an applied voltage, there would be direct current across the junction.

AC effect: When the junction is connected to an applied voltage source, there would be AC current across the junction.

We show the junction in Fig. 11.14. S_1 and S_2 are two superconductors, separated by a thin insulating barrier of width, $d \approx 10$ Å. Both semiconductors are identical.

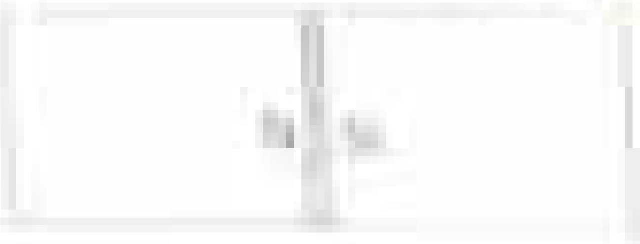


Fig. 11.14: S_1 and S_2 are two superconductors, separated by a thin insulating barrier of width, $d \approx 10$ Å.

where ψ_1 and ψ_2 are the probability amplitudes of the Cooper pairs in S_1 and S_2 respectively. Let θ_1 and θ_2 be the phases associated with these amplitudes. Equations of motion for the tunnelling case

$$i\hbar \frac{\partial \psi_1}{\partial t} = K\psi_2 \qquad (11.84)$$

and

$$i\hbar \frac{\partial \psi_2}{\partial t} = K\psi_1 \qquad (11.85)$$

where K is the coupling constant. Let us try with the following solutions: $\psi_1 = \sqrt{n_1}\, e^{i\theta_1}$ (11.86)

and let us try with the following solution $\psi_2 = \sqrt{n_2}\, e^{i\theta_2}$. (11.87)

where n_1 and n_2 are the densities of cooper pairs in S_1 and S_2 respectively [illegible] and [illegible]. Substituting Eqs. (11.86) and (11.87) in Eq. (11.84) and equating the real and imaginary parts from both sides, we obtain

$$\frac{\partial n_1}{\partial t} = \frac{2K}{\hbar}\sqrt{n_1 n_2}\,\sin\delta \qquad (11.88)$$

and

$$\frac{\partial \theta_1}{\partial t} = -\frac{K}{\hbar}\sqrt{\frac{n_2}{n_1}}\,\cos\delta \qquad (11.89)$$

where

$$\delta = \theta_2 - \theta_1 \qquad (11.90)$$

Similarly substituting Eqs (11.86) and (11.87) in Eq (11.85) and following the same procedure, we obtain

$$\frac{\partial n_2}{\partial t} = -\frac{2K}{\hbar}\sqrt{n_1 n_2}\,\sin\delta \qquad (11.91)$$

and

$$\frac{\partial \theta_2}{\partial t} = -T\sqrt{\frac{n_1}{n_2}}\cos\delta \qquad (11.41)$$

Since under the [illegible] n_1 & n_2 are [illegible] to each other, Eqs. (11.39) and (11.40) [illegible] for $n_1 \approx n_2$

$$\frac{\partial \theta_1}{\partial t} - \frac{\partial \theta_2}{\partial t} = \frac{\partial(\theta_1-\theta_2)}{\partial t} = 0 \text{ or } \frac{\partial \delta}{\partial t} = 0 \qquad (11.42)$$

Thus δ is independent of time. The current across the junction are proportional to $\frac{\partial n_1}{\partial t}$ and $\frac{\partial n_2}{\partial t}$ and hence can be written as,

$$J = J_0 \sin\delta, \qquad (11.43)$$

where J_0 is a [illegible] current which is proportional to the transfer tunnelling [illegible]. The [illegible] J [illegible] is shown in Fig. 11.[illegible]

Fig. 11.[illegible] The current oscillates between J_0 and $-J_0$ at $V=0$, [illegible] the dc Josephson effect.

(b) AC Josephson Effect:

Now let us connect the junction to a voltage source of potential V volts. The energy difference across the junction is qV where q is the charge on the cooper pair. Thus the energy difference is 2eV. Accordingly the coupled equations of motion are

$$i\hbar \frac{\partial \psi_1}{\partial t} = \hbar T \psi_2 - eV\psi_1$$ [illegible]

and

$$i\hbar \frac{\partial \psi_2}{\partial t} = \hbar T \psi_1 + eV\psi_2$$

Substituting Eqs [illegible] and [illegible] in Eqs [illegible] and [illegible] separately and combining the real and imaginary part of the resulting equation we obtain Eqs [illegible] and [illegible] without any change and

$$\frac{\partial \theta_1}{\partial t} = -T\sqrt{\frac{n_2}{n_1}}\cos\delta + \frac{eV}{\hbar}$$ [illegible]

and

$$\frac{\partial \theta_2}{\partial t} = -T\sqrt{\frac{n_1}{n_2}}\cos\delta - \frac{eV}{\hbar}$$ [illegible]

From Eqs [illegible] and [illegible] we have

$$\frac{\partial(\theta_2 - \theta_1)}{\partial t} = -\frac{2eV}{\hbar} = \frac{\partial \delta}{\partial t} = -\frac{2eV}{\hbar}$$ [illegible]

Integrating Eq [illegible]

$$\delta(t) = \delta(0) - \omega t$$ [illegible]

where

$$\omega = \frac{2eV}{\hbar}$$ [illegible]

If V = 1 μV, then the frequency

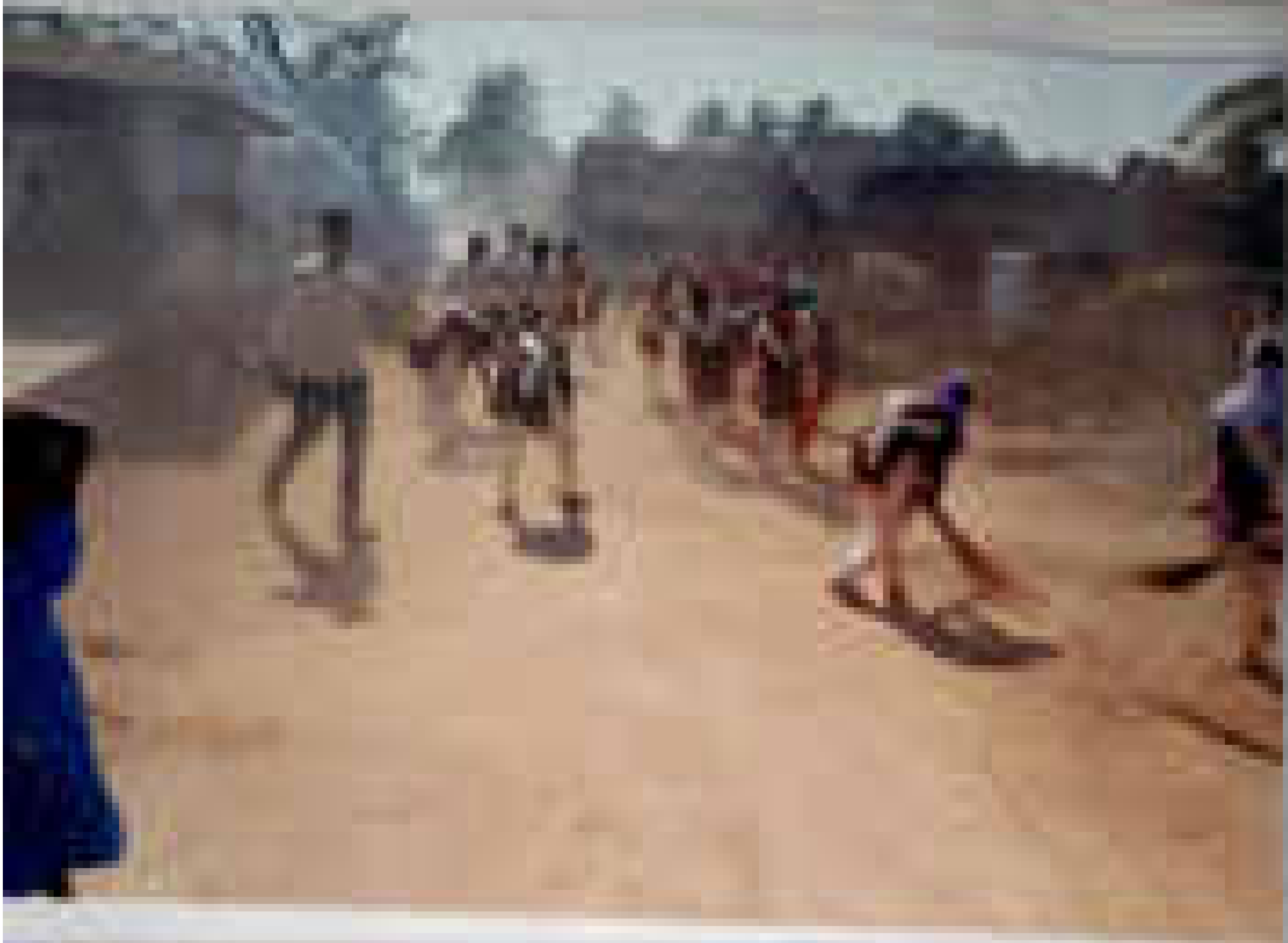
$$\nu = \frac{\omega}{2\pi} = [illegible]$$

Special Camp 2018-19

Special Camp
2011-12

N. S. S. ઉદ્ઘાટન
Camp [illegible]

N S S Special
Camp - 2017-18



N S S Special Camp 2017-18

N.S.S Special Camp

2015-16

Special Camp
at Juamapali

Surgical Strike Days
29.09.18

Surgical Strike
Dibas. 29.9.18

Surgical Strike
Dibas -29/9/18

[illegible]
[illegible]

[illegible]

Human Rights Day. 1.12.1

National Voters Day 2018-19

National Voter Day
2018-19

24/1/19

National Cancer D
4/12/09

akemal

Cancer Day
4/2/19

National Road Safety

Week = 7/2/19

Special Camp - 2019-20

Special Camp - 2019-20

[illegible]

[illegible]

[illegible]

[illegible]

Active Citizenship Progra
20.5.16

N. S. S. Day
. 2016

N S S Day - 2016 (24.9.16)

N.S.S. Day
2016

Constitution Day
26/11/2016

World Aids Day 01-12-16

World Aids Day - 01 12 2016

ACID RAIN

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(a) What is Political Theory?

[illegible]

(b) What is Pragmatic Theory?

[illegible]

ক। What do you mean by Philosophy?

[illegible]

(খ) What is [illegible] philosophy?

[illegible]

(গ) What is [illegible] of [illegible] philosophy?

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(૧) [illegible]

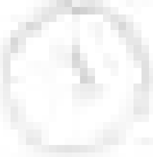
[illegible]

(૨) [illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(1) What is [illegible]?

[illegible]

(2) What is [illegible]?

[illegible]

[illegible]

(1) What do you mean by [illegible]?

[illegible]

(2) What is [illegible]?

[illegible]

(3) What do you mean by [illegible]?

[illegible]

(3) [illegible]

(1) [illegible]

[illegible]

[illegible]

(1) [illegible]

[illegible]

Biodiversity – indicates the number of different species and their relative frequencies in an ecosystem.

Types of Biodiversity

There are three different types of biodiversity

(i) Genetic biodiversity
(ii) Species biodiversity
(iii) Ecological biodiversity

(i) Genetic diversity

→ It refers to the variations [illegible] genetic [illegible] of the organisms [illegible]

[illegible] individuals of a population [illegible] differ from each other in genetic constitution.

[illegible]

(ii) Species Diversity

→ Species diversity is defined as the [illegible] variety of different [illegible] found in [illegible] community of the same [illegible]

→ [illegible]

[illegible]

→ [illegible]

[illegible]

3. Ecological biodiversity

- An ecosystem is a collection of living and non living organisms and their interactions with each other.

- Ecological biodiversity is the variations in the plant and animal species living together and connected by food chain and food webs.

Importance of Biodiversity

- Biodiversity and its maintenance are very important for sustaining life on Earth. A few of the reasons explaining the importance of biodiversity [illegible]

Ecological Stability

[illegible]

Economic Importance

- Biodiversity [illegible]

[illegible]

[illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible]

Two forms of [illegible] [illegible]
Ans: 1) Polyacrylamide [illegible] [illegible] [illegible]
2) [illegible] [illegible]
Paper Chromatography

Q: Define photometer?
Ans: A Spectrophotometer is an instrument that measures the amount of light absorbed by a sample. [illegible] [illegible] [illegible] Spectrophotometer [illegible] used to measure the concentration of solutes in solution by measuring the amount of light that is absorbed by the solution in a cuvette placed in the spectrophotometer.

Q: [illegible]
[illegible] Chromatography [illegible]
Ans: Thin layer [illegible] used to separate chromatographic [illegible] mixture.
Ans: [illegible]
Thin layer Chromatography is performed on a sheet of an inert substance such as glass, plastic or aluminium foil.

[illegible] is [illegible]
physical method [illegible]
both in laboratory

Chromatography

Def:-

→ * Chemical analysis Chromatography is a laboratory technique for the separation of mixture into its components.

→ The mixture is dissolved in a fluid (solvent) called the mobile phase which carries it through a system on which a material called the stationary phase is fixed. the different [illegible]

→ Because the different constituents of the mixture tend to have different affinities for the stationary phase and are retained for different lengths of time depending on their interactions with the mobile phase, causing them to separate.

→ The separation is based on the differential partitioning between the mobile and the stationary phases.

→ Subtle differences in a compound's partition coefficient result in differential retention on the stationary phase and thus affect the separation.

History of Chromatography:

→ Chromatography was first developed in Russia by the Italian born Scientist Mikhail Tswett in 1900.

→ He developed the technique and coined the term chromatography in the first decade of the 20th century, primarily for the separation of plant pigments such as chlorophyll, carotenes and xanthophylls.

→ Since these components separate in bands of different colours (green, orange and yellow respectively) they directly gave the name of the technique.

→ New types of chromatography developed during the 1930s and 1940s made the technique useful for many separation processes.

→ Chromatography technique developed substantially as a result of the work of Archer John Porter Martin and Richard Laurence Millington Synge during the 1940s and 1950s, for which they won the Nobel Prize in Chemistry.

Chromatography terms:

→ Analyte: Substance to be separated during chromatography. It is normally what is needed from the mixture.

→ Analytical chromatography: the use of chromatography to determine the existence and possibly also the concentration of analyte(s) in a sample.

[illegible]

Displacement Chromatography:

[illegible]

[illegible] displacement and elution chromatography.

[illegible]

[illegible] chromatography [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Apical meristem:

1) Apical [illegible] meristem [illegible] the type of [illegible] completely undifferentiated and responsible for [illegible] growth.

2) [illegible] undifferentiated [illegible] [illegible] [illegible] types of cells.

3) They are responsible for the production of [illegible] and [illegible] and are also responsible for the primary plant body.

4) There are 2 types of apical meristem tissue:

(i) Shoot apical meristem (SAM)

(ii) Root apical meristem (RAM)

5) SAM develops in the region at the shoot tip containing undifferentiated cells.

6) RAM is the region at the root tip where all the cells are capable of repeated division.

Lenticels:

1) A lenticel is a porous tissue consisting of cells with large intercellular spaces in the periderm of the secondarily thickened organs.

2) The lenticels act as a pore providing a pathway for the direct exchange of gases between the internal tissues and atmosphere through the bark.

3) The shape of lenticels is one of the characteristics used for tree identification.

(i) [illegible]
(ii) The [illegible] between the [illegible]
(iii) They [illegible]
[illegible]

(2) Simple tissue:-

(i) These tissues are composed of cells which are structurally and functionally similar.

(ii) There are 3 types of simple tissues:-

(a) **Parenchyma**:- parenchyma cells are living [illegible] the power of division.
  (i) The cell [illegible] a [illegible] cytoplasm which contains a small nucleus and surrounds a large central vacuole.

(b) **Collenchyma**:- (i) It forms the [illegible] of living cells.
  (ii) It is characterised by the deposition of [illegible] of the corners of the cells.
  (iii) In collenchyma intercellular spaces are generally absent.
  (iv) Collenchyma cells are [illegible] to [illegible] the [illegible] of the [illegible].

(c) **Sclerenchyma**:- (i) Sclerenchyma cells are dead cells and they are [illegible] for protection.
  (ii) The cell wall of sclerenchyma are greatly thickened by the deposition of lignin.
  (iii) The cells of sclerenchyma are closely packed without intercellular spaces.

Complex tissue:

(i) The complex tissue consists of more than one type of cell all having a common origin. All these cells coordinate to perform a common function.

(ii) Complex tissue are two types: Xylem and phloem.

(iii) Xylem and phloem are both conducting tissue and also known as vascular tissue together both these constitute vascular bundle.

Xylem:

(i) Xylem is a complex and permanent tissue.

(ii) It is composed of cells of 4 different types.

(iii) ① Tracheids ② Vessels ③ Xylem parenchyma
④ Xylem sclerenchyma

(iv) Except xylem parenchyma all other elements are dead and bounded by thick lignified wall.

(v) Tracheids and vessels are tubular structures.

Function:

(i) The main function of xylem is to convey water and mineral salts upward from the root to different parts of plants hence also called water conducting tissue.

(ii) The thick-walled xylem cells also help in the mechanical support of plants.

Phloem

(i) Phloem is a living conducting tissue

(ii) It is composed of [illegible] cells and elements

(iii) Sieve tubes, [illegible] companion cells, phloem parenchyma

& phloem fibres

(iv) Phloem fibres are [illegible] [illegible] [illegible] [illegible] [illegible]

(v) Phloem parenchyma are [illegible] [illegible] [illegible] [illegible]

parenchyma of phloem

Function

Phloem transports photosynthetic [illegible] food materials from the leaves to the storage organs and other [illegible] regions to the growing regions of the plant body

---

[illegible]

(i) [illegible]

(ii) [illegible]

(iii) The ABO blood group system in humans is an example of multiple allele.

Incomplete Dominance:

(i) It means the dominance activity of a gene for a pair of contrasting character is not complete.

(ii) [illegible]

(iii) [illegible]

(iv) Example: [illegible] cross between red and white [illegible] Mirabilis Jalapa plants with intermediate flower colour i.e. pink colour in F_1 generation.

(v) The ratio 1:2:1 is produced in F_2 generation.

Lethal allele:

(i) Lethal alleles are alleles that cause an organism to die only when present in a homozygous condition.

(ii) The gene involved is sometimes an essential gene and the lethal allele may be either dominant or recessive.

(iii) An example of lethal allele in human is achondroplasia, a genetic condition which causes dwarfism.

[illegible] in ratio of the heterozygotes will generate a 1:2:1 ratio.

(v) In codominance, the [illegible] heterozygotes are expressed to generate 1:2:1 ratio.

Chromosomal aberration:

(i) Chromosomal aberrations are changes in the structure or number of chromosomes, which are capable of inherited genetic defect.

(ii) Human typically have 23 pairs of chromosomes, of which 22 pairs are autosomal, last pair is chromosomes are sex chromosomes which determine an individual's sex (biological).

(iii) A change in any of the chromosomes, in structure or number, can [illegible] a chromosomal disorder and may cause medical disorder.

(iv) Chromosomal aberration can be classified as structural or numerical aberration.

(v) The 4 main types of structural chromosomal aberrations are deletion, duplication, inversion, translocation.

(vi) Deletion occurs when a portion of the chromosome is deleted which can make the chromosome non functional.

(vii) In duplication, part of the chromosome is duplicated resulting in extra genetic material. This occurs in Charcot-Marie-Tooth disease.

(a) Deletion: It is a chromosomal [illegible] when the specific portion of particular chromosome and [illegible] [illegible] chromosome.

(b) Translocation: occurs when a piece of one chromosome has broken off from its original location and attached to another chromosome.

(c) Duplication, translocation, etc are potential causes of infertility.

Human Chromosomal disorders:

(a) Chromosomal disorders are most commonly the result of aneuploidies which may result after fertilisation.

(b) Trisomy 21 or the presence of an extra chromosome 21 is the cause of Down syndrome.

(c) The other two most common autosomal trisomies are trisomy 18 which results in Edward's syndrome and trisomy 13 which leads to Patau syndrome.

(d) Aneuploidies of the sex chromosomes are also occur but they usually present with different symptoms than autosomal disorders.

(e) Turner syndrome is the only sex chromosome monosomy, which occurs when a person inherits only one X chromosome and is usually assigned female at birth.

[illegible] the role of Chromosomal [illegible].

1) People may reduce some risk of chromosomal abnormalities by adopting [illegible] healthy [illegible] habits, limiting exposure to potentially [illegible] substances and [illegible] [illegible] [illegible] [illegible] pregnancy.

2) If a chromosomal disorder has been identified in a family, a healthcare provider may recommend genetic counselling to discuss different options, including assisted reproductive technologies.

Class: [illegible]
Chemistry Honours
Name: [illegible]
Roll No.:
(B) Analytical Chemistry

---

1. a) What is chemical shift ? write the factors affecting chemical shift ?
b) Define NMR ?

2) What is shielding and deshielding of proton ?

Ans :

1) a) Chemical Shift :

"The shift in the position of NMR absorption which arises due to shielding or deshielding of protons by the electrons are called chemical shift.

For measuring chemical shift of various protons, a Signal from tetra methyl silane (TMS) is taken as reference.

Then the least [illegible] value of the TMS, the shielding of equivalent protons in TMS is [illegible]

TMS is taken as reference because of the following reasons :-

(i) It is miscible in all organic solvent.

(ii) It is highly volatile, thus can be easily removed from the system.

(iii) It doesn't take part in intermolecular hydrogen bonding with the sample.

A chemical shift is also defined as the difference in ppm between the resonance frequency of the observed proton and that of the TMS hydrogen.

chemical shift (δ) = $\frac{\text{frequency of signal from reference}}{\text{spectrometer frequency}} \times 10^6$

$= \frac{\text{frequency signal} - \text{frequency of reference}}{\text{spectrometer frequency}} \times 10^6$

δ = 10 − τ

high frequency upfield

deshielded downfield

Factors affecting chemical shift –

The chemical shift of a molecule is affected by the following factors.

a) Inductive effect –

A proton is said to be deshielded if it is attached to an electronegative group. ⇒ Greater the EN, greater is the deshielding and more will be δ value (ppm).

b) Hydrogen bonding – It is found that a hydrogen atom exhibiting property of H-bonding in a compound absorbs at a low field in comparison to one which doesn't. H-bonded proton being attached to a highly EN atom will have smaller e⁻ density around it; being less shielded the field felt by such a proton will be more and hence the resonance will occur downfield.

5. NMR :-

Nuclear magnetic resonance spectroscopy is a technique which is based on the absorption of electromagnetic radiation. In the radio frequency region [illegible] by the [illegible]. There are 2 common types of NMR spectroscopy used [illegible] [illegible].

1) ^1H NMR

It is used to determine the type and no. of H atoms in molecule.

2. ^{13}C NMR

It is used to determine the type of carbon in a molecule.

Theory of NMR :-

Spin quantum no. (I) is related to the atomic and mass no. of the nucleus as follows.

I	Atomic mass	Atomic no.	Example
Half integer	odd odd	odd even	[illegible]
0			
Integer			

Chhatri Kumari Maharana
Chemistry Honours
Roll No.
4th Semester

CHM-41

1. a) Write the postulates of MOT [illegible]
b) Draw the [illegible] bonding, type and [illegible]

1. a. Describe molecular orbital diagram H_2...

Answer

1. Molecular Orbital Theory :-

This theory was given by Hund and Mulliken in 1932, to explain the molecular structure. The main postulates of this theory are :

i) The wavefunction of all electrons in a molecule is called it's molecular orbital.

ii) The molecular orbital is formed by the linear combination of atomic orbitals of comparable energies.

iii) The number of molecular orbitals formed is equal to the number of atomic orbitals combined.

iv) The atomic orbitals combined to form molecular orbitals and in which one of these has lower energy and is called bonding molecular orbital which is more stable. And the other has higher energy which is called antibonding molecular orbital and is less stable.

v) A molecular orbital (MO) can hold [illegible] accommodate maximum of two electrons with opposite spin which is in accordance with pauli's exclusion principle.

v) The ~~molecular~~ [illegible] [illegible] ~~[illegible]~~ AO can ~~accommodate~~ maximum of two electrons with opposite s.

vi) The molecular orbitals are filled with electrons in order of their increasing energies which is in accordance with Aufbau's principle.

vii) The shape of molecular orbitals depends upon the shape of AO.

viii) Electron pairing in degenerate molecular orbitals takes place until each orbital is half filled which is in accordance with Hund's rule.

ix) The wave function of the molecular orbital is given by the relation,

$$\psi_{MO} = c_1\psi_A + c_2\psi_B$$

where

c_1 & c_2 are coefficients.

x) The sequence of energy molecular orbital for homonuclear molecules of elements with atomic number 1 to 7 is

$\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < \pi 2p_x = \pi 2p_y < \sigma 2p_z$
$< \pi^* 2p_x = \pi^* 2p_y < \sigma^* 2p_z$

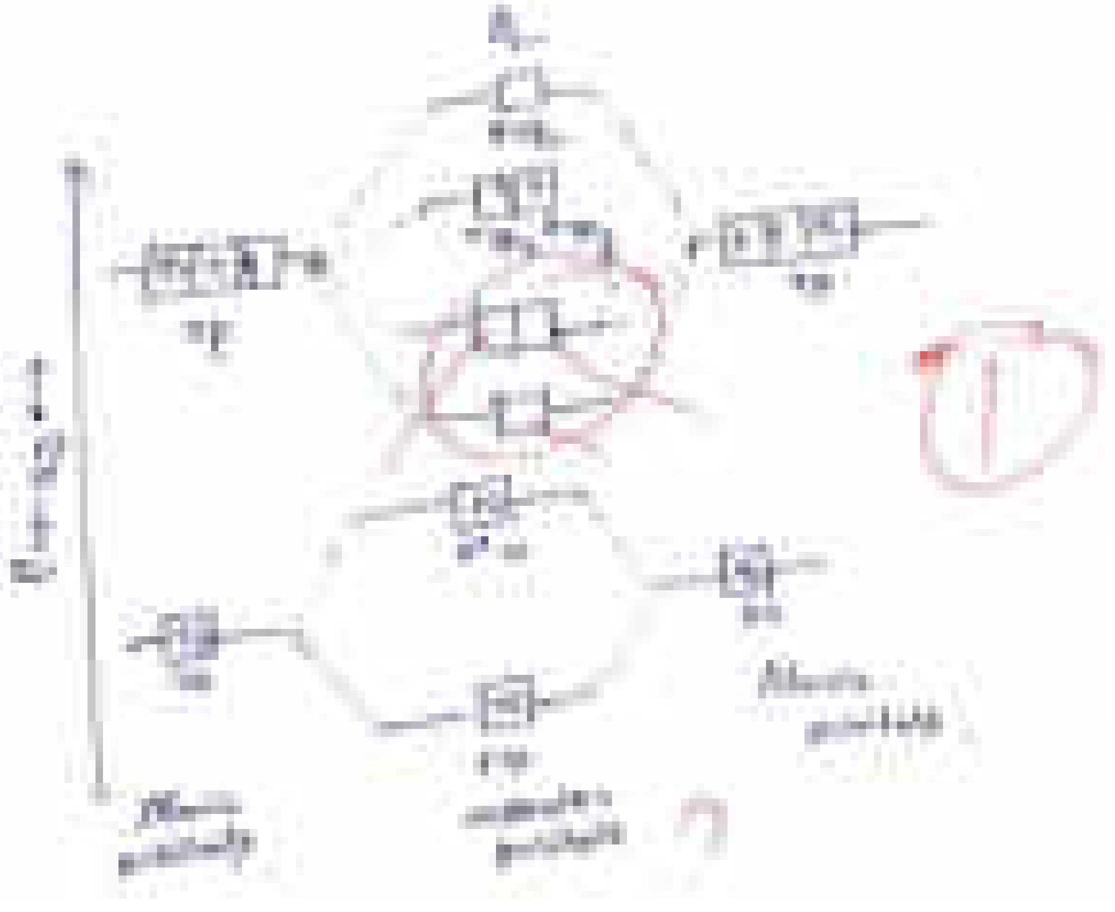
& for O_2,

$\sigma 1s < \sigma^* 1s < \sigma 2s < \sigma^* 2s < \sigma 2p_z < \pi 2p_x =$
$= \pi 2p_y < \pi^* 2p_x = \pi^* 2p_y < \sigma^* 2p_z$

Q. Difference between BMO and ABMO :

BMO	ABMO
(i) It is formed by the addition of AOs i.e. $\psi_A + \psi_B = \psi_b$	(i) It is formed by the subtraction of AOs i.e. $\psi_A - \psi_B = \psi^*$
(ii) It has more electron density in the region between the two nuclei, which leads to the stability of the bond.	(ii) It has less electron density in the region between the two nuclei, which leads to the instability of the bond.
(iii) It possesses less energy than the atomic orbitals from which it is formed.	(iii) It possesses higher energy than the atomic orbitals from which it is formed.
(iv) Nodes are not present.	(iv) Nodes are present.
(v) These are designated as σ, π, δ etc.	(v) These are designated as $\sigma^*, \pi^*, \delta^*$ etc.

Q. C = 1s 2s $2p_x$ $2p_y$ $2p_z$



DSE-3

Chemistry Honours

Chandi [illegible] [illegible]

Roll No

43 [illegible] [illegible]

1.a. Determine the molecular mass of polymers by Osmotic pressure method.?

b. Determine the molecular mass of polymers by Viscosity method.?

2. Define Number Average molecular weight(Mn)?

[illegible]

Ans. - 1a) Osmotic pressure method :-

The osmotic pressure of solution of macromolecules even at low concentration, are significant and can be easily measured. Hence osmotic pressure of macromolecular solution can be used to determine the molecular weight of such substances.

According to van't Hoff equation,

$$\pi V = nRT$$

$$\pi V = (w/M)RT$$

$$\pi = (w/V)RT/M$$

$$\pi = cRT/M$$

$$\frac{\pi}{c} = \frac{RT}{M} \longrightarrow (1)$$

where π = Osmotic Pressure of macromolecular solution.

c = Conc^n of solution

π/c = reduced osmotic pressure

M = molecular weight of macromolecules

R = Gas constant

Equation ① holds good only at infinite dilution. Therefore eqn ① becomes,

$$\left(\frac{\pi}{c}\right)_{c\to 0} = \frac{RT}{M} \text{ ——— } ②$$

where $(\pi/c)_{c\to 0}$ = limiting or reduced osmotic pressure

The osmotic pressure of dilute solution of polymer is measured at different concentration.

If a graph is plotted between π/c and c, a straight line is obtained.

- When this line is extrapolated to c = 0, the intercept on π/c axis gives the value of $(\pi/c)_{c\to 0}$. On substituting this value in eqn ②, the molecular weight of polymer is calculated.
- Since osmotic pressure is colligative property i.e. depends on the no. of molecules, the value of molecular weight obtained by osmotic pressure method will be the number average molecular weight $\bar{M}_n$.

b) The viscometry method introduced by Staudinger which is one of the most commonly used method in day-to-day development. This is due to the fact that experimental procedures including the method are very simple and efficient, and required a simple apparatus. However, this is not an absolute method.

To find the molecular weight using viscosity data, it is necessary to use empirical equations which give viscosity as a function of the molecular weight. Viscosities of polymer solutions are usually higher than those of pure solvent.

Let the relative viscosity = η_r

Viscosity of polymer solution = η

Viscosity of pure solvent = η_0

① So, $\eta_r = \frac{\eta}{\eta_0}$

The viscosity of solvent and solution are directly proportional to time.

Let the flow time of solvent = t_0

flow time of solution = t

② Relative viscosity = $\eta_r = \frac{t}{t_0}$

③ Specific viscosity (η_{sp}) of the polymer solution $\frac{\eta}{\eta_0} - 1 = \frac{\eta - \eta_0}{\eta_0}$

where η_r is the relative viscosity.

The relative viscosity (η_r) is related to specific viscosity (η_{sp}) by the following equation.

$\eta_r - 1 = \eta_{sp}$ or $\eta_r = 1 + \eta_{sp}$

Reduced viscosity
It is the ratio of specific viscosity
[η_{sp}] to the concentration of the solution
i.e. concentration

$$\eta_{red} = \frac{\eta_{sp}}{C}$$

(d) Inherent viscosity
The inherent viscosity is the ratio of logarithm of relative viscosity (η_r) to the concentration of the solution.

$$\text{Inherent viscosity} = \frac{\ln \eta_r}{C}$$

If the polymer solution is very dilute, then

$$\frac{\ln \eta_r}{C} = \frac{\ln(1+\eta_{sp})}{C} = \frac{\eta_{sp}}{C}\left[1 - \frac{1}{2}\eta_{sp} + \frac{1}{3}\eta_{sp}^2\right]$$

and therefore, $\lim_{C\to 0} \frac{\ln \eta_r}{C} = \lim_{C\to 0} \frac{\eta_{sp}}{C} = [\eta]$

where $[\eta]$ is called intrinsic viscosity and its unit is dl/g (deciliter/gram)

The intrinsic viscosity is related to molecular weight of polymer according to following equation.

$$[\eta] = KM^a$$

where K, a = constants

M = molecular weight

2. Weight Average Molecular weight ($\bar{M}_w$)

In this method, the molecular weight of each molecule and species is multiplied by its contribution to the total molecular and all the products so obtained are added to get the weight average molecular weight.

→ The contribution of i-mer to the total molecular weight = $\frac{n_iM_i}{\sum_i n_iM_i}$

So, the contribution of all species to the molecular weight =

$$\frac{n_1M_1}{\sum_i n_iM_i} + \frac{n_2M_2}{\sum_i n_iM_i} + \frac{n_3M_3}{\sum_i n_iM_i} + \dots + \frac{n_iM_i}{\sum_i n_iM_i}$$

Multiplying the molecular weight of each molecular species to its contribution to the total molecular weight, we can obtain.

$$\bar{M}_w = \frac{n_1M_1M_1}{\sum_i n_iM_i} + \frac{n_2M_2M_2}{\sum_i n_iM_i} + \frac{n_3M_3M_3}{\sum_i n_iM_i} + \dots + \frac{n_iM_iM_i}{\sum_i n_iM_i}$$

$$\Rightarrow \bar{M}_w = \frac{n_1M_1^2 + n_2M_2^2 + n_3M_3^2 + \dots + n_iM_i^2}{\sum_i n_iM_i}$$

$$\Rightarrow \bar{M}_w = \frac{\sum_{i=1}^{\infty} n_iM_i^2}{\sum_{i=1}^{\infty} n_iM_i}$$

→ The weight average molecular weight depends on the weight of the polymer in higher volume of the solution.

→ The molecular weight of the polymer determined by light scattering, sedimentation equilibrium and viscosity measurement is known as the weight-average molecular weight.

Chemistry Homework
CIA - 3
[illegible]
Roll No.
[illegible]

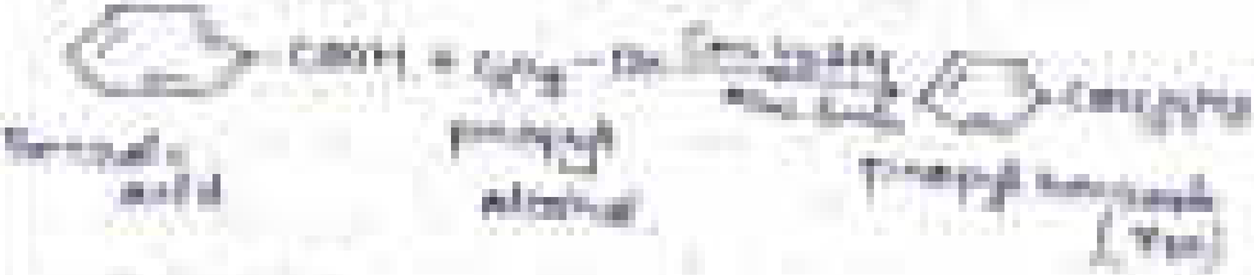
1. a. Explain about the microwave assisted reactions in water?
b. What is catalysis? How is comparative statement between homogeneous and heterogeneous catalysis used for green chemistry with suitable example?
2. Write the preparation of Methylmethacrylate (MMA) by conventional method as well as Green Synthesis?

Ans 1(a) i) Hofmann elimination:- In this process the quaternary ammonium salts was heated at high temperature and the yield of the product is less. But use of microwave irradiation has led to high yield (about 98%) synthesis (Bhargava et al 1995). In this process water/chloroform is used as solvent.

ii) Hydrolysis of benzyl chloride to benzyl alcohol:- In this reaction being performed in microwave oven, it will give yield and the reaction complete in 3 minute compared to [illegible] in the organic synthesis.

iii) **Oxidation reaction**:- Oxidation of toluene in microwave condition gives 40% yield in 5 min whereas the under normal condition (using heating) it takes 10-12 hours.

iv) **Esterification**:- In presence of organic solvent (Conc. H2SO4) when benzoic acid is heated with propyl alcohol in microwave oven for 6 min propyl benzoate is formed.



b) Ans - The chemical reactions which are carried out in the presence of catalyst are known as catalysed reaction or catalysis. It is of two types.

(i) **Homogeneous catalysis**: The catalysed reaction in which the catalyst and the reactants are in same phase are called homogeneous catalysis.

Example :-

1. $2SO_2(g) + O_2(g) \xrightarrow{NO(g)} 2SO_3(g)$
2. $CH_3COOCH_3(l) + H_2O(l) \xrightarrow{HCl(l)} CH_3COOH(aq) + CH_3OH(aq)$
3. $C_{12}H_{22}O_{11}(aq) + H_2O(l) \xrightarrow{H_2SO_4(l)} C_6H_{12}O_6(aq) + C_6H_{12}O_6(aq)$
(Sucrose) (Glucose) (Fructose)

In example 1, reactants and catalyst all are in gaseous state and in example 2 and 3, reactants and the catalysts are in liquid phase i.e. they all the same phase and form homogeneous system.

ii) **Heterogeneous catalysts** :- The catalysed reactions in which the catalyst and the reactants are in different phase are known as heterogeneous catalysts.

Example :-

1. Synthesis of ammonia by Haber's process using Fe catalyst
$N_2(g) + 3H_2(g) \xrightarrow[Mo]{Fe(s)} 2NH_3(g)$
5.
2. Preparation of nitric acid from ammonia by Ostwald's process using platinum catalyst.
$4NH_3(g) + 5O_2(g) \xrightarrow[(s)]{Pt} 4NO(g) + 6H_2O(g)$
3. Preparation catalysed reactions using zeolite as a catalyst (Shape selective catalyst):
Zeolite (ZSM-5 - zeolite Socony mobil-5) commercially used from ZSM-5, in all alcohols directly into gasoline belonging to

Pentasil family of zeolites. Chemical formula of ZSM-5 catalyst is $Na_nAl_nSi_{96-n}O_{192} \cdot 16H_2O$ ($0 < n < 27$). It was produced by Mobil oil company in 1972. It is widely used in petroleum industries as a heterogeneous catalyst for hydrocarbon isomerization reaction.

Ex: (1) Isomerization of m-xylene to p-xylene

(2) Preparation of ethylbenzene from benzene

(3) Reduction of butyne

$CH_3-C\equiv C-CH_3 \xrightarrow[\text{Al, [illegible] Ni, catalyst}]{2H_2} CH_3-CH_2-CH_2-CH_3$ n-butane

cis-but-2-ene

<u>Advantages</u>:

This process takes place at mild conditions, phase are highly selective and associated with ease of heat transfer from solution.

<u>Disadvantages</u>: The main disadvantage is the separation of product from solvent and recycling of the catalyst. The products obtained by this method.

B. Conventional method :

The preparation of methyl isocyanate (MIC) by conventional method :

$CH_3-NH_2 + COCl_2 \longrightarrow CH_3-NH-\overset{O}{\overset{\|}{C}}-Cl$

(methyl amine)

methyl carbamoyl chloride (MCC)

The methylisocyanate is obtained by heating the MCC with tertiary amines such as N, N-dimethyl aniline or with pyridine or by separating it by using distillation technique.

$CH_3-NH-COCl \rightleftharpoons CH_3-N=C=O + HCl$
(MIC)

Green Synthesis of MIC :

Waldmann et al - J. Chem. Soc (Comm) 1994) have earlier proposed alternatively from CO_2 by reacting with methyl amine under mild condition (room - 0-25°C) in presence of suitable base catalyst. Followed by dehydration with P_2O_5.

$CH_3-NH_2 + CO_2 \xrightarrow{\text{base}} CH_3-NHCOOH \xrightarrow[-H_2O]{P_2O_5} CH_3-NCO$

Thus, in this new technique, the use of toxic $COCl_2$ gas is avoided.

Abhinav Rai

Chemistry Homework
Class - 11 [illegible]
Core - 2
1st Semester

1) a. Give brief idea about Arrhenius theory of electrolytic dissociation? (2+2)

b. Write the theory of acid-base indicators?

c.

12/15

Write short note: 2×3

2) a) Find the pH value of 0.001 M of H_2SO_4?

b) Explain common ion effect with example?

c) What is solubility product?

Answers

1) As to Arrhenius theory, acid is a substance which give H^+ ion after dissociation. [illegible]

-> Base is a substance which give OH^- ion after dissociation. Ex - NaOH → Na^+ + OH^-

-> ~~Salt is a substance which give [illegible] after dissociation~~ [illegible]

-> Salt is a [illegible] where acid and base react with each other to form salt is neutral.

-> As to Arrhenius theory the electrolytic dissociation of acid, when an salt is dissolved in water, it breaks in [illegible] due to [illegible] having positive and negative charge. 4½

Positive charge is [illegible] and negative charge is [illegible] anion

Ex- HCl is a substance which dissolve in water to give H^+ and Cl^-

Applying law of mass action

$$K_1 = \frac{[A^+][B^-]}{[AB]}$$

6) Acid - base Indicator :-

An acid base Indicator is defined as a substance which changes its colour with variation in pH value of the solution to which it is added. The pH range differs considerably from one Indicator to another.

Ostwald's theory :-

According to this theory, an acid-base Indicator is a weak organic acid. The unionised and ionised part of the Indicator show different colours in solution.

Let HIn ionises as

$$HIn \rightleftharpoons H^+ + In^-$$

6

If the solution is acidic, increase in H^+ ion concentration shifts the equilibrium towards left, and hence HIn. On the other hand if the solution is alkaline, the decrease in concentration of H^+ ion shifts the equilibrium towards right and the colour of the solution will be due to the ionised part i.e In

Action of Phenolphthalein

It is colourless organic compound. It dissolves in water, dissociates slightly to form H^+ ions (colourless) and Ph^- ions (Pink).

$$HPh \rightleftharpoons H^+ + Ph^-$$

If the solution is acidic by adding HCl the concentration of H^+ ion shift the equilibrium towards left, and the colour will be due to HPh i.e colourless. If the solution is alkaline by adding few drops of NaOH, the OH^- ions react with H^+ ions to form H_2O and therefore the decrease in H^+ ion concentration will shift the equilibrium towards right and the colour will be due to Ph^- ion i.e Pink.

② $H_2SO_4 \rightleftharpoons 2H^+ + SO_4^{2-}$

10^{-3} 10^{-3} 10^{-3}

$2H^+ = 10^{-3}$

$H^+ = 2\times10^{-3}$ (3)

$pH = -\log 2\times10^{-3}$

$pH = -[\log 2 + \log 10^{-3}]$

$= -[0.3010 - 3\log 10]$

$= -[0.3010 - 3]$

Chemistry Assignment [illegible]

(Sec-1) B.Sc 1st Semester

Roll no.- [illegible]

Name- [illegible]

Set-no.- [illegible]

1(a) Explain the postulates of Bohr's atomic model? (2+3)

(b) [illegible]

2(a) Explain [illegible]

12/15

Answer

(a) Bohr's atomic model

To explain [illegible] defects of Rutherford's atomic model [illegible] Bohr's atomic model.

The main postulates of this theory are:

i) An atom consists of a dense positively charged nucleus at [illegible] centre called nucleus.

ii) The electrons are revolving around the nucleus in a definite circular path called orbits.

iii) These orbits are associated with definite amount of energy thus these are called energy levels.

These energy levels are named as K, L, M, N.

iv) [illegible] energy [illegible] the electrons are revolving in the orbit [illegible] energy.

v) When an electron absorbs energy [illegible] it jumps from lower energy level to higher energy level.

vi) When it [illegible] energy it jumps from higher energy level to lower energy level.

vii) The energy difference between two energy levels is given

$\Delta E = E_2 - E_1 = h\nu$

a) [illegible] Aufbau principle

According to this principle: "The electrons are filled in various orbitals in the order of their increasing energy."

→ An orbital with [illegible] energy will be filled first.

→ In German the word Aufbau means building up of this principle. [illegible] the electrons are filled in various orbitals in order of their increasing energy.

→ [illegible] [illegible] [illegible] [illegible] [illegible]

* (n+l) Rule

1) The orbital with lower (n+l) value will possess lower energy and will be filled first.

Ex:- 4s = [illegible] [illegible] [illegible]

Energy: 4s = 4+0 = 4

3d = 3+2 = 5

2) If two orbitals have the same (n+l) value then the orbital with lower value of n possesses lower energy.

Ex:- 3d [illegible] [illegible] [illegible] than 4p

3d = 3+2 = 5

4p = 4+1 = 5

The value of n+l is same for 3d and 4p [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] Sig. of de Broglie's equation

i) The wave character of large objects (macroscopic) has no practical significance, as its wavelength [illegible] [illegible] is too small to be observed.

ii) The wave character of microscopic particles (ex: electrons) has practical significance, as its wavelength can be easily observed.

$$\lambda = \frac{h}{mv}$$

+3 2nd semester (Chemistry)
Name - [illegible]
Roll no - [illegible]
Group - B (Inert gases)

1. Q. [illegible] XeF₄ [illegible] structure and hybridisation.

Ans.

Xenon Tetrafluoride (XeF₄)

Preparation:-

→ When a mixture of Xe and F_2 ([illegible]) is heated in a [illegible] vessel at [illegible] XeF₄ is formed.

$$Xe + 2F_2 \xrightarrow{[illegible]} XeF_4$$

→ When a mixture of Xe and F_2 is irradiated with [illegible] at room temperature the product XeF₄ is formed.

$$Xe + 2F_2 \xrightarrow{[illegible]} XeF_4$$

Properties:-

→ It is colourless crystalline solid having [illegible] and soluble in [illegible] and [illegible].

→ It is good [illegible] oxidising.

(i) It oxidises H_2 to [illegible]

$XeF_4 + 2H_2 \xrightarrow{[illegible]} [illegible]$

(ii) It oxidises Hg to HgF_2

$XeF_4 + 2Hg \longrightarrow Xe + 2HgF_2$

(c) It oxidises KI to I_2.

$XeF_4 + 4KI \longrightarrow 2I_2 + Xe + 4KF$

⇒ It is easily hydrolysis by H_2O to give XeO_3

$XeF_4 + H_2O \longrightarrow XeOF_2 + 2HF$

$XeF_4 + NaOH \longrightarrow NaXeO_3 + NaF + H_2O$

$XeF_4 + 12H_2O \longrightarrow Xe + XeO_3 + 4HF + 3O_2$

⇒ It is stronger fluorinating agent than XeF_2.

$XeF_4 + Pt \longrightarrow Xe + PtF_4$

$XeF_4 + 4HCl \longrightarrow Xe + 4HF + 2Cl_2$

$XeF_4 + 2C_6H_6 \longrightarrow Xe + 2HF + 2C_6H_5F$

$XeF_4 + 4KI \longrightarrow 2I_2 + Xe + 4KF$

Structure:-

$Xe^{(54)}$ (G.S.) -

(E.S.) -

One 5s, three 5p and two 5d orbitals of Xe atom intermix to give 6 sp^3d^2 hybrid orbitals in which two sp^3d^2 hybrid orbitals contain lone pair of e^- while others are half filled. The half filled sp^3d^2 orbitals of Xe atom overlaps with

[illegible]
[illegible] unpaired [illegible]
are filled orbitals so [illegible]
Therefore it has [illegible]
distorted geometry.

4b) What are clathrates?

Clathrates:-

A clathrate is a chemical substance consisting of a lattice which contains molecules. The word clathrates which derive from the Latin word "clathratus" which means protected lattice.

Sir Humphry Davy in 1810 discovered the first clathrate known as hydrate of chlorine.

According to Powell clathrate compound consists of [illegible] molecules of one substance called the "guest" trapped with in the cavities of crystal lattice of some organic and some inorganic compound called "host".

The general formula of clathrate is H_xG_y

where, x = no. of host (H) molecules present in a unit cage cell

y = no. of guest (G) molecules present in a cage.

[illegible]

[illegible] together are weak intermolecular forces.

Condition of forming clathrate:-

i) Cavities of appropriate dimensions be present in the crystal lattice of host as that of the guest.

ii) The guest particle should not be highly volatile.

Stability of clathrate compounds:-

The clathrate compounds are stable due to the following reasons.

i) The guest atom (or) molecules with in the cavities have van der waals force of attraction.

ii) Hydrogen bonding in clathrates is stronger than that is present in normal crystalline lattice of host alone.

Types of clathrates:-

clathrates are of 4 types

i) Gas hydrates
ii) Quinol clathrates
iii) Radio active clathrates
iv) Phenol clathrates.

Uses:-

→ It helps to separate hydrocarbons.

→ Eliminates the physiological action.

→ These are used to [illegible] noble gases —

→ It helps to determine the type of mixture of He, Ar, Kr and Xe.

(4) Write the uses of He.

Ans.

Uses of Helium:-

→ An oxygen helium mixture is used in treat asthma because it diffuses more rapidly through constricted lung passage.

→ It is used as a cooling medium in atomic reactor because of its inert nature.

→ It is used in filling tyres of big aeroplanes.

→ A mixture of He and H is used to fill air ships and weather [illegible] balloons.

→ An oxygen and He mixture is used by sea divers for respiration [illegible] [illegible] causes [illegible] bends due to [illegible].

+3, 2nd Semester
Chemistry honours
Name- [illegible]
Roll no.- [illegible]-26
Paper - 8 (Carbonyl compound)

1. Write note on
i) Aldol condensation.
ii) Cannizzaro's reaction.
iii) Haloform reaction.

2. Prepare CH_3CHO from CH_3CH_2OH and CH_3COCl

Ans:

1. i) Aldol condensation

Two molecules of aldehydes (or ketones) having α-hydrogen atom undergo condensation in presence of dilute alkali gives an aldol or β-hydroxy aldehyde or in case of ketones, a few ... condensation products depending upon the reaction conditions. This reaction is called aldol condensation (or) ... condensation ... ketones).

$CH_3CHO + CH_3CHO \longrightarrow H_3C-\underset{OH}{CH}-CH_2-CHO$

Acetaldehyde (2 molecules)

β-hydroxy butanal (aldol)

Mechanism

The mechanism of this reaction involves the following steps

(i) Hydroxide ion abstracts a proton from the α-carbon of the aldehyde to form a carbanion.

(ii) Cannizzaro reaction:— [illegible]

Aldehydes do not having α-hydrogen atom reacts with conc^n NaOH to form sodium salt of fatty acid and an alcohol

Benzaldehyde   Sodium benzoate   Benzyl alcohol

Mechanism:

The mechanism of this reaction involves the following steps

Step-1

Step-2

Step-3

$\longrightarrow C_6H_5CH_2OH + C_6H_5COO^-$

Benzyl alcohol   Benzoate ion

$C_6H_5COO^- + H^+ \longrightarrow C_6H_5COOH$

(ii) **Haloform reaction:**

When aldehyde and ketone containing CH_3-C group are reacting with halogen and aqueous NaOH form haloform.

$X_2 + 2NaOH \longrightarrow NaOX + NaX + H_2O$
halogen   sodium hypohalite

$CH_3CHO + 3NaOX \xrightarrow{\Delta} CX_3CHO + 3NaOH$

$CX_3CHO + NaOH \longrightarrow CHX_3 + HCOONa$

Trihaloacetaldehyde   haloform

Mechanism:

The mechanism of this reaction involves the following steps.

Step-1

$CH_3-CH=O + NaOX \longrightarrow$ [illegible] $+ H_2O$

Step-2

$CH_3CHO + 3NaOX \longrightarrow$ [illegible]

Step-3

Rosenmund's reduction:

Aldehydes can be prepared by the reduction of acid chloride in presence of palladium catalyst (Pd-BaSO4).

$RCOCl + H_2 \xrightarrow{Pd-BaSO_4} RCHO + HCl$

$CH_3COCl + H_2 \xrightarrow{Pd-BaSO_4} CH_3CHO + HCl$

Ethanoyl chloride

Ethanal chloride

Formaldehyde (HCHO) can not be prepared by this method because HCOCl is unstable at room temp.

Mechanism:

This mechanism involves hydrogenation of carbonyl group followed by the elimination of HCl.

(b) Ketones are formed when acid chloride is treated with dialkyl cadmium in presence of dry ether.

$2RCOCl + R'_2Cd \xrightarrow{\text{dry ether}} 2R-\overset{O}{\overset{\|}{C}}-R' + CdCl_2$

Acid chloride

Ketone

From alcohol:-

Aldehydes can be obtained by the direct oxidation of primary alcohols with acidified $K_2Cr_2O_7$ or by the alkaline potassium permanganate ($KMnO_4$)

$RCH_2OH + [O] \xrightarrow{KMnO_4} RCHO + H_2O$
1°-alcohol aldehyde

$\overset{R}{\underset{R}{>}}CHOH + [O] \longrightarrow \overset{R}{\underset{R}{>}}C=O + H_2O$
2°-alcohol ketone

Wacker process:-

Palladium catalysed oxidation of alkene to aldehyde as well as ketone. This process is known as Wacker's process.

$CH_2=CH_2 + \frac{1}{2}O_2 \xrightarrow[CuCl_2]{PdCl_2} CH_3CHO$

Mechanism:-

The

$CH_2=CH_2 + PdCl_2 + H_2O \longrightarrow$ [illegible]

$\longrightarrow CH_3CHO + Pd + HCl$

Chemistry Assignment
[illegible] and [illegible] ([illegible])
Name - [illegible]
Roll no - [illegible]

1(a) Derive expression for 'k' for 1st order reaction

(b) Differentiate between molecularity and order of reaction.

(c) a. Write a rate in Arrhenius equation.

Ans. Rate expression for 1st order reaction:-

1.(a) Those are the reactions in which the rate of reaction depends upon the conc. of one reacting species.

Consider a general reaction

$$A \longrightarrow B$$

$$\begin{array}{cc} a & 0 \\ a-x & x \end{array}$$

Let the potential conc. of A be a moles per litre after time 't' second x moles of A decomposes to give x moles of B.

Rate $\propto [A]$

(or) $dx/dt = k(a-x)$

$\Rightarrow \frac{dx}{a-x} = k\,dt$

Integrating on both sides,

$$\int \frac{dx}{a-x} = \int k\,dt$$

$\Rightarrow -\ln(a-x) = kt + c$ ——— ①

at t = initial, $x = 0$

Putting in eq^n ①

$-\ln a = c \Rightarrow c = -\ln a$

5

putting the value of c in eq^n ①, we get,

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

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

$\Rightarrow kt = \ln \frac{a}{a-x}$

$$\Rightarrow \boxed{k = \frac{1}{t}\, 2.303 \log \frac{a}{a-x}}$$

1. Q.) Differentiate between molecularity and order of reaction.

4

Molecularity	Order of reaction
⇒ Molecularity is the no. of molecules taking part in a single step of a reaction.	Order of reaction is defined as sum of the powers (exponents) to which the conc^n terms are raised in the rate law.
⇒ It is always a whole no.	It may be a whole no. or a fraction.
⇒ It is never zero	⇒ It may be zero
⇒ It is a theoretical value determined from the single step of a chemical reaction.	⇒ It is an experimental value obtained from the rate eq^n.
⇒ It's value does not exceed	⇒ It's value can exceed 3.

2. Arrhenius eqⁿ :-

The quantitative relationship between rate constant and temperature is given by the following eqⁿ known as Arrhenius equation.

$$k = Ae^{-Ea/RT}$$

5

where k = rate constant

A = frequency factor and is a constant.

e = exponential factor

Ea = activation energy

R = gas constant

T = Temperature.

Taking logarithm on both sides,

$$\ln k = \ln Ae^{-Ea/RT}$$

$$\ln k = \ln A - \frac{Ea}{RT}$$

$$2.303 \log k = 2.303 \log A - Ea/RT$$

$$\log k = \log A - Ea/2.303RT.$$

Name of the Examination [illegible]
Examination Roll No [illegible]
Registration No [illegible]
Date & Time [illegible]
Subject [illegible]
Paper [illegible]
Subject code [illegible]

[illegible]

[illegible]

NAME OF THE EXAMINATION :- [illegible]

EXAMINATION ROLL No :- 16

DATE & YEAR :- 24/2/2020

SUBJECT :- History

PAPER :- II

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2. [illegible]

(i) [illegible]

[illegible]

(ii) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

3. [illegible]

(i) [illegible]

[illegible]

[illegible]

- [illegible]

[illegible]

[illegible]

- [illegible]

[illegible]

[illegible]

[illegible]

- [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Name of the Examinee: [illegible]

Subject - History

Class - 12

Roll no - 79

Time - 1 hour

14/20

Q) [illegible] the causes and results of [illegible] of the [illegible] :

[illegible]

Name- [illegible]
Class- [illegible] (Economics)
Semester- 2nd
Teacher- [illegible]

9/10

Q. Explain the Rostow's stages theory of growth?

Economic growth is a multidimensional phenomenon. Both economic and non-economic factors influence the economic growth. A number of first [illegible] country have to [illegible] different stages during the course of the economic growth. They are called the stages of economic growth.

Karl Marx has classified the stages into 4 categories. They are — i) Primitive ii) [illegible] iii) Capitalism iv) Communism.

W.W. Rostow in his famous book "The stages of economic growth (1960)" has made another attempt [illegible] classified the process of economic growth into 5 stages.

The traditional society stage-1

In the process of economic growth first and primary stage is the stage of traditional society. Its features —

Features :-

i) Predominance of agriculture
ii) Predominance of family and clan system
iii) Political power

④ [illegible] [illegible] and [illegible] [illegible]
[illegible] of [illegible] sectors.

③ The pre-conditions of take off :- ([illegible])

The second stage of economic growth is one in which pre-conditions for take off are created in a country.

Features :-

(i) Rapid improvement in agriculture
(ii) Expansion of trade [illegible] [illegible]
(iii) Rate of saving and investment

④ The take off stage - ([illegible])

The take off stage is a critical stage in the economic history of any country. With these [illegible] changes an economic transformation [illegible].

Features :-

(i) Industrial revolution, (ii) [illegible] [illegible]
(iii) Increase in demand
(iv) Political environment

⑤ The drive to maturity :-

Take-off stage is followed by a stage [illegible] maturity stage.

Features :-

(i) Changes in the character of labour
(ii) Changes in the character of entrepreneurs
(iii) Technological changes

The stage of high mass consumption :-

[illegible] due to the fast and most advanced stage of economic growth. There is a considerable increase in production.

Features :-

1) Concentration of [illegible] [illegible] facilities [illegible]

2) [illegible] of [illegible] of the [illegible] [illegible]

3) There is a [illegible] of [illegible] [illegible]

Criticism of Rostow's stage theory :-

1) Transitional society not necessary for development

2) not applicable in all countries.

3) Overlapping of different stages

4) The stage of high mass consumption not [illegible].

5) [illegible] of [illegible]

— X —

Name: [illegible]
Class: [illegible]
Roll no - [illegible]
[illegible] test

$\frac{11}{15}$

1) Explain the functions of money ?

A) Money performs four main functions in economy's activity and multiply [illegible] :

1. A medium of exchange
2. A standard of deferred payment
3. A store of value
4. A measure of value

Barter - Economy :

In barter, goods and services are directly exchanged for goods and services without the use of an monetary transaction between the parties involved.

- Each of the parties involved in a transaction must be in need what the other party has to offer.
- The goods and services exchanged should be acceptable.

Money as a medium of exchange :-

A medium of exchange is an asset that can be used in a transaction to exchange goods and services.

1. It must be readily acceptable [illegible] and form of [illegible] of value that it can buy [illegible] everywhere.
2. It must be easily [illegible].

Money as a store of wealth

All assets can't be stored [illegible] of years [illegible], society requires some effective ways to store wealth.

Money as a measure of value :-

Money can be used as a reference unit of account to measure the value of the goods and services exchanged in an economy.

Problems faced by money :-

Eventually, by the end, there were other [illegible] [illegible] have been successfully [illegible] as a money to [illegible] security [illegible] due to the [illegible].

1. They were original members of [illegible] for [illegible] [illegible] [illegible] in the future [illegible] [illegible] [illegible] [illegible] [illegible] to their nation.

2. Teachers [illegible] [illegible] in some stage of growth [illegible] they [illegible] [illegible]. They are [illegible] to [illegible] their [illegible] [illegible] others would have [illegible] them in the future [illegible] that [illegible] [illegible].

Name : [illegible]
[illegible]
Economics [illegible]
[illegible]

Q) Explain the Rostow stages theory of growth?

Ans) Economic growth is a multidimensional phenomenon. Both economic and non-economic factors influencing the economic growth. It is a matter of fact every country has to pass through different stages during the course of its economic growth.

Different economists have classified the stages of economic growth to various perspective.

Adam Smith the father of the economics growth in [illegible] sequence (i) hunting (ii) pastoral (iii) agriculture (iv) commercial & manufacturing.

Karl Marx : he classified the stages to the economic growth process (1848) [illegible] capitalism and [illegible].

W.W. Rostow : he specified [illegible] the stages of economic growth [illegible] stages.

① The traditional society : It is the primary stage of economic growth. [illegible] It is the society based on technology and the society [illegible] the primitive level of the technology.

Features: iii) [illegible] transformation of agriculture

iv) [illegible] of [illegible] and [illegible] system

v) [illegible]

vi) large scale [illegible]

vii) dependence on the changing [illegible]

3) [illegible] conditions of [illegible]

(3) The pre-conditions of take-off: the [illegible] of [illegible] all the [illegible] stages of economic growth that [illegible] for the [illegible].

It may be called a transition stage [illegible] for [illegible] [illegible].

It may be the preconditions for the take-off stage.

Characteristics of [illegible]

The pre-condition stage [illegible] [illegible] [illegible] the [illegible] and organisation [illegible] [illegible] and [illegible] [illegible].

The stage [illegible] [illegible].

Features:

1) [illegible] [illegible] [illegible]

2) [illegible] [illegible]

3) [illegible] [illegible]

4) Role of [illegible] and [illegible]

5) [illegible] the [illegible] of [illegible]

6) [illegible] of [illegible]

(4) The take-off stage

[illegible] [illegible] stage is [illegible] [illegible] [illegible] stage.

In the [illegible] of [illegible] 1757 to 1813 period of [illegible]
in which [illegible] [illegible] [illegible] traditional
of the policy [illegible] stage [illegible] [illegible]
the [illegible] of [illegible] they [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

Condition of the [illegible] stage :-

(a) [illegible] of [illegible] [illegible]
(b) [illegible] of the [illegible] [illegible]
(c) [illegible] [illegible] [illegible]

Features :-

a) Economic [illegible]
b) [illegible] [illegible] [illegible] [illegible]
c) [illegible] [illegible]
d) Foreign trade
e) New [illegible] for [illegible]
f) [illegible] [illegible] [illegible] [illegible]

d) The policy of [illegible] :-

Free trade stage is followed by [illegible]

[illegible] stage

[illegible] approach :-

[illegible] [illegible] the [illegible] [illegible] the policy
[illegible] the [illegible] [illegible] [illegible]
[illegible] [illegible] the stage of [illegible]

Problems :-

(i) Increase in the [illegible] of [illegible] force
(ii) Change " " " " " entrepreneurship
(iii) Technological change
(iv) [illegible] for the investment rate

(5) **The stage of high mass consumption :-**

It was the last and most important stage of economic growth. [illegible] of capital and [illegible] are the main features in this stage the [illegible] of the economy.

Features :-

i) Consumption of capital and durable goods
ii) Standard of living of the people rises
iii) This is a period of consumer sovereignty
iv) More funds are supplied to high

Criticism of Rostow's Stage theory :-

i) No justification. Theory and history [illegible] arguments
ii) Not applicable to all nations.
iii) Over lapping of different stage
iv) The stage high mass consumption is vague

(1) [illegible] : study and history for development
(2) Not applicable to all countries
(3) [illegible] points are [illegible]

Name - [illegible]

[illegible] - [illegible]

[illegible] = 27

[illegible]

Date - [illegible]

Q) What is money, functions of money?

Ans) Money performs four main functions in today's society. Functions of money are as:

1. ★ Medium of exchange
2. ★ Standard of deferred payment
3. ★ Store of wealth
4. ★ Measurement of value

Barter economy:

In barter people are generally able to exchange goods for goods with the other party who is to offer the [illegible] [illegible] [illegible]

The economy based barter would face some [illegible]:

- ★ Each of the parties involved in exchange would have to want what the other party has to offer. The difficulty in the exchange where barter system faces is a [illegible] of [illegible] [illegible] [illegible].
- ★ The goods and services exchanged should be [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible]

Money as a medium of exchange

A medium of exchange is an object that can be used in a transaction of exchange goods and [illegible] [illegible] and other [illegible] [illegible] as a medium of exchange [illegible] money is [illegible] examples is

① It must be widely acceptable - this generally [illegible] if the medium of exchange has a [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] that the [illegible] is [illegible] by [illegible] [illegible] [illegible]

② It must be easily divisible a good [illegible] of change [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] generally [illegible] be different.

Money as a standard of deferred payment

The third function is [illegible] [illegible] [illegible] of the [illegible] [illegible] [illegible] [illegible] [illegible] function in the future to be a standard of deferred payment money must be accepted [illegible] [illegible] [illegible] [illegible] [illegible] the future.

Money as a store of wealth

As function [illegible] be [illegible] [illegible] a part and [illegible] [illegible] [illegible] effective way of storing [illegible] [illegible] money can be

Money can be easily divided segments and [illegible]

[illegible] [illegible] as portable and all the value

Money are function of [illegible]

Money can also act as consistent unit [illegible] of measuring the value of all the goods and services exchanged in economy.

In a money based economy prices can be indicated using only the number of value [illegible] and proper understanding of worth goods and services is worth

Precious Metals as Money

Especially in the past gold and other precious metals have been frequently used as money in many societies it is due to the following:

① They were a good medium of exchange for [illegible] [illegible] [illegible] in the form of their value and [illegible] they could

② precious metals are durable and [illegible] good store wealth as they are not perishable goods.

However, other would agree that [illegible] things such as jewelry and ornaments would [illegible] their [illegible].

[illegible]
Name - [illegible]
Roll no. - [illegible]
[illegible]

1. (a) What is measurement.
(b) What is [illegible] [illegible]
(c) What is [illegible] [illegible]

2. [illegible] the [illegible] of measurement.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (Scaling of measurement)

[illegible]

[illegible]

[illegible]

([illegible]) [illegible] →

[illegible]

([illegible]) [illegible] →

[illegible]

([illegible]) [illegible] → [illegible] 10 [illegible] 20 [illegible]

[illegible]
[illegible]
[illegible]
[illegible]

1. [illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

2. [illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1- Briefly Discuss the meaning & nature of educational research.

[illegible]

[illegible]

(a) [illegible] educational research.

(b) Write any two [illegible] of educational research.

(c) What is educational research.

[illegible]

1) [illegible]

[illegible]

[illegible]

[illegible] Paper — methodology

Name: [illegible]

Roll no: 75

[illegible]

1. (a) What is psychology

(b) Any one application of psychology.

(c) What is growth.

2. Briefly discuss the observation method.

Answer

1. (a) [illegible] psychology [illegible]

(b) psychology [illegible]

[illegible]

(c) [illegible]

[illegible]

[illegible]

[illegible] [illegible] [illegible]
[illegible] [illegible]

1. [illegible]

[illegible] - ([illegible])

[illegible]

[illegible]

[illegible]

(1) [illegible]

[illegible]

[illegible]

ઉદા:- [illegible]

[illegible]

[illegible]

ઉદા:- [illegible]

[illegible]:

[illegible]:

[illegible]

ઉદા:- [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

1) [illegible]
2) [illegible]

Name- Sapana patil
Class- [illegible] 2nd year
Stream- [illegible]
Sub- English
Date- 21-1-2022

[illegible]/20

Answers

Q1) I have learning all [illegible] the words.
b) Culture is in maharashtra.
c) The boy is addicted to watching television.
d) He was relieved from his duties.
e) I could see her through the glass door.

Q2) Communication is symbolic in nature.
b) phonetics basically deals with single aspect of language.
c) We have 20 number of vowel sound in english language.
d) IPA consist of 107 number of sounds.
e) There are 21 consonants in english alphabet.

Q3) Skimming - while reading newspaper, magazines, pamphlet or brochures.
Scanning - while looking for date or numbers on [illegible] sheet, names of people, places, timing of places in a table or air travel schedule.

(2)

Q4) phoneme is linguistics smallest unit of sound distinguishing one word from another. A phoneme may have more than one variant, called as allophone which function as single sound.

⇨ A word which has three syllable is calling Polysyllabic word.

Examples: Achievement, Species, Government, Editorial, university, computer.

⇨ Variation in pitch sound is called intonation. In a sentence we give stress on a particular word and pronounce it in loudness it is called Intonation.

⇨ In two syllable or more than two syllable words we give special emphasis on a particular syllable. We utter that syllable more loudly, we pronounce it louder than other syllables. This loudness is called stress in a word.

NAME OF THE EXAMINATION :- Surprise test

EXAMINATION ROLL NO :- 13

DATE & YEAR :- 27/01/2020

SUBJECT :- History

PAPER :- CORE - 1

1 MARK

① Harappan was discovered by ______

Ans:- [illegible] ।

② Who is the author of Mudrarakshasa ?

Ans:- [illegible] ।

③ Who was the [illegible] [illegible] [illegible] in [illegible]

Ans:- [illegible] ।

2 MARKS

① What are the names of the four Vedas ?
Which one is the oldest Veda ?

Ans:- [illegible] ।
[illegible]
[illegible] ।

② How many types of [illegible] ?

Ans:- [illegible]
[illegible]
[illegible] ।

[illegible] :—

[illegible]

[illegible] ।

[illegible]

[illegible]

[illegible]

[illegible] ।

[illegible] ।

[illegible] ।

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(8) Discuss about the sources of Indian History.

Ans:- [illegible] ।

(i) [illegible]

(ii) [illegible]

(i) [illegible] :- [illegible] ।

(a) [illegible]

(b) [illegible]

(c) [illegible]

(a) [illegible]

(b) [illegible] ।

(ii) [illegible] :- [illegible] ।

[illegible]

(a) [illegible]

(b) [illegible]

(c) [illegible]

(a) [illegible]

NAME OF THE EXAMINATION :— [illegible] test

EXAMINATION ROLL NO :— [illegible]

DATE & YEAR :— [illegible]

SUBJECT :— History

PAPER :— CORE-II[illegible]

[illegible]

1) [illegible]

Ans— [illegible]

2) [illegible]

Ans— [illegible]

3) ———— [illegible]

Ans— [illegible]

[illegible]

1) [illegible]

Ans— [illegible]

[illegible] ।

[illegible] ।

[illegible] ।

[illegible]

[illegible] ।

[illegible] ।

[illegible] ।

[illegible] ।

[illegible] – [illegible]

[illegible] – [illegible]

[illegible]

[illegible]

[illegible]

[illegible] – [illegible]

[illegible]

NAME OF THE EXAMINATION: SEMESTER [illegible]

Examination Roll No: [illegible]

DATE & TIME :- 20|08|2020

PAPER :- Core-6

TIME :- 1 HOUR

SUBJECT – HISTORY

(a) Louis (XIV)

Ans) [illegible]

(b) Vasco-da-Gama

Ans) [illegible]

(c) Leonardo-da-Vinci

Ans) [illegible]

(d) [illegible]

[illegible]

[illegible]

[illegible]

१) [illegible]

२) [illegible]

३) [illegible]

४) [illegible]

५) [illegible]

६) [illegible]

७) [illegible]

८) [illegible]

९) [illegible]

(h) [illegible]

[illegible]

NAME OF THE EXAMINATION – [illegible]
EXAMINATION ROLL NO – [illegible]
DATE [illegible] –
SUBJECT – [illegible]
SCORE – (8)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Mathematics

[illegible]

[illegible]

[illegible]

1. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. Answer the following questions [illegible]

a. Compute A + B, [illegible]

[illegible] $A = \begin{bmatrix} [illegible] \end{bmatrix}$ [illegible] $\begin{bmatrix} [illegible] \end{bmatrix}$

$C = \begin{bmatrix} [illegible] \end{bmatrix}$ and $E = \begin{bmatrix} [illegible] \end{bmatrix}$

b. Compare the [illegible] of [illegible] with [illegible] examples

[illegible]

2. Answer the following questions

a. Find A^{-1} [illegible] $A = \begin{bmatrix} [illegible] \end{bmatrix}$.

b. Construct the finite field

$F_2 ([illegible])$

[illegible]

Name : [illegible]

Date : [illegible]

Sub : Mathematics

[illegible]

A = [illegible] B = [illegible]

[illegible]

[illegible]

[illegible]

2. [illegible]

[illegible]

[illegible]

[illegible]

$A = \begin{bmatrix} [illegible] \end{bmatrix}$

$|A| =$ [illegible]

[illegible]

[illegible]

$M_{11} =$ [illegible] $M_{12} =$ [illegible]

$M_{13} =$ [illegible]

$M_{21} =$ [illegible] $M_{22} =$ [illegible]

$M_{23} =$ [illegible]

p	q	~q	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

∴ The [illegible] is not tautology.

[illegible]

[illegible] at the [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Putting [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Putting [illegible]

[illegible]

[illegible]

[illegible] at the

[illegible] (0,0) [illegible]

[illegible]

[illegible]

[illegible]

Mathematics

September - 2013

Course # [illegible]

1. Answer the following questions [illegible] Marks: [illegible]

a) Find the pde by eliminating arbitrary constants [illegible]

b) Find the order and degree of the differential equation [illegible]

2. Answer the following questions. [illegible]

a) Solve [illegible]

Mathematics

September 2013

Course # [illegible]

1. Answer the following questions. [illegible]

a) What is the [illegible] Give an example.

b) Prove that [illegible]

2. Answer the following questions. [illegible]

a) State and prove the Cauchy mean value theorem.

Name: [illegible]
[illegible]: [illegible]
[illegible]: [illegible]
[illegible]: 2nd year
Sub: [illegible]
[illegible]: [illegible]
[illegible]: 3

Q. What is indeterminate forms?

Ans. An indeterminate form is an expression involving two functions whose limit cannot be determined solely from the limits of the individual functions. These forms are common in [illegible] [illegible] the limits [illegible] of the [illegible] is [illegible] as an indeterminate form.

Example: $\frac{0}{0}, \frac{\infty}{\infty}, 0\cdot\infty, \infty-\infty, 1^\infty$

Q. Calculate the $\lim_{x\to 0}$ $\frac{\ln x}{x}$ value.

$f(x) = \frac{\ln x}{x}$

$\lim_{x\to 0^+} f(x) = \frac{[illegible]}{[illegible]}$

$\lim_{x\to 0^-} f(x) = \frac{[illegible]}{[illegible]} = [illegible]$

[illegible]

Let $f(x)$ and $g(x)$ [illegible] continuous on [illegible]

and differentiable in (a,b) and [illegible]

$g'(x) \neq 0$ [illegible] (a,b), [illegible]

There [illegible] at least [illegible] c [illegible]

Such that

$$\frac{f(b)-f(a)}{g(b)-g(a)} = \frac{f'(c)}{g'(c)}$$

Proof:

Let us [illegible]

$F(x) = f(x) - A\,g(x)$ — (i)

Where A is constant,

[illegible] $F(a) = F(b)$

$\Rightarrow f(a) - A\,g(a) = f(b) - A\,g(b)$

$\Rightarrow A\,g(a) - A\,g(b) = f(a) - f(b)$

$\Rightarrow A[g(a) - g(b)] = f(a) - f(b)$

$\therefore A = \dfrac{f(b)-f(a)}{g(b)-g(a)}$ — (ii)

As functions f and g [illegible] continuous

on $[a,b]$

and $e^{g(x)}$ is also continuous on $[a,b]$

$\therefore$ $F(x)$ is continuous on $[a,b]$.

(because sum of two cont. functions must be continuous)

Similarly f and g are differentiable on (a,b)

$\therefore$ $e^{g(x)}$ is also diff. on (a,b)

$\therefore$ $F(x)$ is also diff. on (a,b)

(because the sum of two diff. function is diff.)

Also we have $F(a) = F(b)$

then by Rolle's theorem $\exists$

one point $c \in (a,b)$

c = $\boxed{\text{[illegible]}}$

We have $F(x) = f(x) + e^{g(x)}$

$F'(x) = f'(x) + e^{g(x)} g'(x)$

$F'(c) = f'(c) + e^{g(c)} g'(c)$

$F'(c) = 0$

$\Rightarrow f'(c) + e^{g(c)} g'(c) = 0$

[illegible]

$\Rightarrow$ [illegible]

$\therefore$ [illegible]

Putting value [illegible] in [illegible] we get

[illegible]

(Ans)

Name:- [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Q.) Find the PDE by eliminating arbitrary function

Given $z = f(x - ay)$

Let, $z = f(x - ay)$ — (1)

Diff. eq. (1) by partially w.r.t. x

$$\frac{\partial z}{\partial x} = f'(x - ay)$$

$$\Rightarrow p = f'(x - ay) — (2)$$

Again diff. eq. (1) by partially w.r.t. y

$$\frac{\partial z}{\partial y} = f'(x - ay)(-a)$$

$$\Rightarrow q = -a f'(x - ay) — (3)$$

Putting the value of $f'(x - ay)$ from eq. (2)

Putting the value of $f'(x - ay)$ from eq. (3)

$$\Rightarrow q = -ap$$

$$\Rightarrow \boxed{q + ap = 0}$$

[illegible] [illegible]

Q) Find the order and degree of the ODE

$$y\left[1+\left(\frac{d^2y}{dx^2}\right)^{2}\left(\frac{dy}{dx}\right)^{2}\right] = x\left(\frac{dy}{dx}\right)$$

Ans:- order = [illegible]

degree = [illegible]

Q3) Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$

Soln:- $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ — (1)

Above Lagrange's linear eqn

Above eq (1) is of the form $Pp+Qq=R$

Its auxiliary Lagrange's subsidiary eqn is

∴ A.E. eqn are subsidiary eqn

$$\frac{dx}{x^2(y-z)} = \frac{dy}{y^2(z-x)} = \frac{dz}{z^2(x-y)}$$

Using $\frac{1}{x^2}, \frac{1}{y^2}, \frac{1}{z^2}$ as multipliers, we get

each fraction $= \dfrac{\frac{dx}{x^2} + \frac{dy}{y^2} + \frac{dz}{z^2}}{\cancel{y}-\cancel{z}+\cancel{z}-\cancel{x}+\cancel{x}-\cancel{y}}$

$$\therefore \frac{dx}{x^2} + \frac{dy}{y^2} + \frac{dz}{z^2} = ⓪$$

$\Rightarrow \frac{dx}{x^2} + \frac{dy}{y^2} + \frac{dz}{z^2} = 0$

$\Rightarrow \int \frac{dx}{x^2} + \int \frac{dy}{y^2} + \int \frac{dz}{z^2} = \int 0$

$\Rightarrow -\frac{1}{x} - \frac{1}{y} - \frac{1}{z} = c$

$\Rightarrow \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = -c = c_1$ — ①

Again taking $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$ as multipliers.

we get each ratio $= \dfrac{\frac{dx}{x} + \frac{dy}{y} + \frac{dz}{z}}{x(y-z) + y(z-x) + z(x-y)}$

$$= \dfrac{\frac{dx}{x} + \frac{dy}{y} + \frac{dz}{z}}{xy - xz + yz - xy + zx - zy}$$

$\Rightarrow \frac{dx}{x} + \frac{dy}{y} + \frac{dz}{z} = 0$

$\Rightarrow \int \frac{dx}{x} + \int \frac{dy}{y} + \int \frac{dz}{z} = \int 0$

$\Rightarrow \ln x + \ln y + \ln z = \ln c$

$\Rightarrow \ln xyz = \ln c$

$\Rightarrow xyz = c_2$ — ②

$\therefore$ Required soln. $f\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z},\ xyz\right) = 0$

(Ans.)

[illegible]

Thus [illegible]

lim [illegible]

(proved)

(3) Show that [illegible] lim [illegible] exists.

Ans. putting [illegible]

[illegible]

[illegible]

[illegible]

Q. Write the definition of vector space and give an example?

Ans: A non-empty set V is said to be a vector space [illegible]

[illegible]

Example:

[illegible]

(2) For any vector space V [illegible]

a) [illegible]

b) [illegible]

Proof:

a) Let V be a any vector space [illegible]

[illegible]

[illegible]

[illegible]

*) Formulation of LPP :-

Linear programming [illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]

[illegible] LPP :

[illegible] Z = [illegible]

Subject to [illegible]

[illegible]

[illegible]

[illegible]

graphically

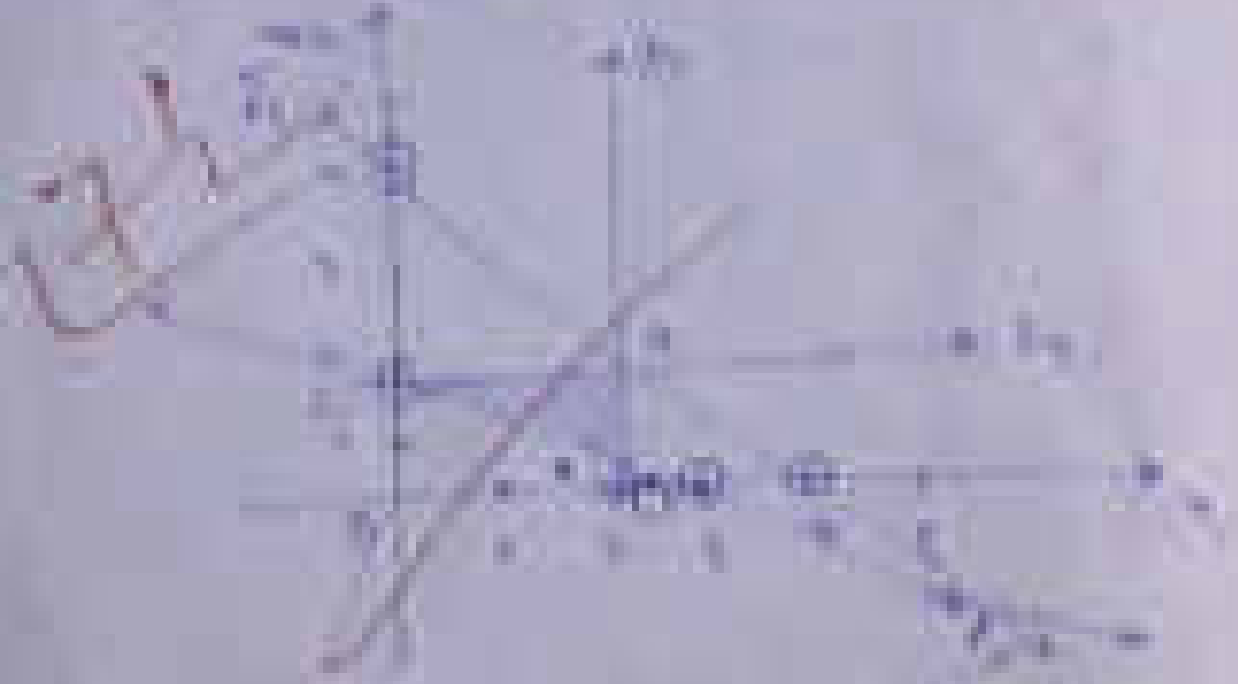
[illegible] — [illegible] Z = [illegible]

[illegible] — ①

[illegible] — ②

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible] — ①

[illegible] — ②

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] — ③

[illegible] — ④

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Date – [illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]

Answer

1. [illegible]
2. [illegible]
3. [illegible]

[illegible]
[illegible]
[illegible] ।

[illegible]
[illegible] ।

[illegible]
[illegible]

[illegible]
[illegible] ।

[illegible]
[illegible] ।

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]
[illegible]
[illegible] ।
[illegible] ।
[illegible] ।
[illegible]

Name- [illegible]
Class [illegible]
Roll no- 30
Date-
[illegible] Unit- 2

[illegible]

[illegible]

① [illegible] ?
② [illegible] ?
③ [illegible] ?
④ [illegible] ?
⑤ [illegible] ?

[illegible]

① [illegible]

- [illegible]
- [illegible]

① [illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

- [illegible]
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[illegible]

[illegible]

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- [illegible]
- [illegible]
- [illegible]

Name :- [illegible]
Class :- [illegible]
Roll No :- [illegible]
Date :- [illegible]
Exam - [illegible]

[illegible]

[illegible]

[illegible]

Name - [illegible]
Class - [illegible]
[illegible]
4-3-2020 [illegible]

[illegible]

(1) [illegible]
(2) [illegible]
(3) [illegible]
(4) [illegible]
(5) [illegible]

[illegible]

(1) - [illegible]
- [illegible]
- [illegible]
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M.A 2nd year [illegible] (Odia)
CORE- [illegible]
Assignment test
date- [illegible]/2022

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Q.4) Prove that $x^2 = \frac{\pi^2}{3} + 4\sum_{n=1}^{\infty} (-1)^n \frac{\cos nx}{n^2}$, $-\pi < x < \pi$

Ans:

We know $f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx + \sum_{n=1}^{\infty} b_n \sin nx$

Let $f(x) = x^2$

Then $a_0 = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\,dx = \frac{1}{\pi}\int_{-\pi}^{\pi} x^2\,dx = \frac{1}{\pi}\left[\frac{x^3}{3}\right]_{-\pi}^{\pi}$

$a_0 = \frac{1}{\pi}\left(\frac{\pi^3}{3} + \frac{\pi^3}{3}\right) = \frac{2\pi^2}{3}$

Now $a_n = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\cos nx\,dx = \frac{1}{\pi}\int_{-\pi}^{\pi} x^2 \cos nx\,dx$

$= \frac{1}{\pi}\left[x^2 \int \cos nx\,dx - \int 2x \int \cos nx\,dx\right]$

$= \frac{1}{\pi}\left[\left(x^2 \frac{\sin nx}{n}\right)_{-\pi}^{\pi} - 2\int_{-\pi}^{\pi} x \frac{\sin nx}{n}\,dx\right]$

$= \frac{1}{\pi}\left[\{\pi^2 \sin n\pi - \pi^2 \sin n(-\pi)\}\right]$ [illegible]

$= \frac{1}{\pi}\left[\left(\ldots\right)\right]_{-\pi}^{\pi}$ [illegible]

$= \frac{1}{\pi}\left[\ldots\right]$ [illegible]

$a_n = \frac{2}{\pi}\left[\frac{\ldots}{n^2}\right] = \frac{4}{n^2}(-1)^n$

Similarly $b_n = \frac{1}{\pi}\int_{-\pi}^{\pi} f(x)\sin nx\,dx = \frac{1}{\pi}\int_{-\pi}^{\pi} x^2 \sin nx\,dx$

$= \frac{2}{\pi}\left[x^2 \int \cos nx\,dx - \int 2x \int \cos nx\,dx \right]$

$= \frac{2}{\pi}\left[\left\{ x^2 \left(\frac{\sin nx}{n} \right) \right\}_0^{\pi} - 2\int_0^{\pi} x \left(\frac{\sin nx}{n} \right) dx \right]$

[illegible] Using the value of $\int f(x)\,dx$ [illegible] when $f(x)$ is an odd function. Hence $f(x) = x^2$ being an even function [illegible] $b_n = 0$, the Fourier [illegible] the formula

$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx + \sum_{n=1}^{\infty} b_n \sin nx$

i.e. $f(x) = \frac{2\pi^2/3}{2} + \sum_{n=1}^{\infty} \frac{4}{n^2} (-1)^n \cos nx$

$\therefore x^2 = \frac{\pi^2}{3} + 4\sum_{n=1}^{\infty} (-1)^n \frac{\cos nx}{n^2}$ (Ans)

3(c) Write Parseval's identity for Fourier [illegible] cosine series of $f(x)$

Ans

For cosine series $a_n = \frac{2}{l}\int_0^l f(x)\cos\frac{n\pi x}{l}\,dx$ [illegible]

[illegible] $\left[x \left(\frac{l}{n\pi} \sin\frac{n\pi x}{l} \right) - (1)\left(\frac{-l^2}{n^2\pi^2} \cos\frac{n\pi x}{l} \right) \right]$

$= \frac{2l}{n^2\pi^2}(\cos n\pi - 1)$ [illegible]

and $a_0 = \frac{2}{l}\int_0^l f(x)\,dx$ [illegible]

Using Parseval's identity we have

$\frac{2}{l}\int_0^l [f(x)]^2\,dx = \frac{a_0^2}{2} + \sum_{n=1}^{\infty}(a_n^2 + b_n^2)$

[illegible] $\frac{2}{l}\int [f(x)]^2\,dx = $ [illegible]

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Physics [illegible]

Q3) First law of thermodynamics applied to an isothermal process explain it?

Ans. First law of thermodynamics applied to an isothermal process.

According to first law of thermodynamics

$$dQ = dU + dW \quad \text{--- (1)}$$

where dQ = small amount of heat given to gas, dU = increase in internal energy of gas & dW = work done against external pressure.

In an isothermal process temperature of the gas remains constant hence there is no change in the internal energy of the gas

i.e. $dU = 0$

Putting this value in equation (1)

$$dQ = dW$$

Case-I: During isothermal expansion of gas dW is positive therefore heat will have to be supplied to gas.

Case-II: During isothermal compression of gas dW is negative therefore heat will be rejected by gas.

[illegible] eqn of an isothermal process

Ans :-

We know that the ideal gas eqn which give the gas equation is given by

$PV = nRT$

P = Pressure of gas

V = volume of gas

T = temperature of gas

R = Gas constant [illegible] of gas

Since for an isothermal process (temperature constant),

(5) $PV = $ constant

nRT constant

$PV = $ constant

This is the eqn of an isothermal process

Let the initial [illegible] of gas P_1, V_1, where the pressure & volume of the gas

Let P_2 & V_2 are the final pressure & volume of gas at final state

Consider that the gas moves from initial state (P_1, V_1) to final state (P_2, V_2) by an isothermal process

Then eqn for an isothermal process becomes

$P_1V_1 = P_2V_2$

5) (i) What [illegible] process?

Ans

A [illegible] process can be defined as [illegible] the system & its surroundings [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible]

(ii) define isothermal process

Ans

An isothermal process is a thermodynamic process in which the temperature (T) of the system remains constant [illegible] the change [illegible] [illegible] [illegible] any system where the temperature is [illegible] [illegible] isothermal process

(iii) Explain Kelvin Planck statement

Ans

The Kelvin-Planck statement of the second law of thermodynamics [illegible] it is not possible to design a device that operates on a cycle [illegible] [illegible] only [illegible] absorption of heat [illegible] [illegible] [illegible] single [illegible] [illegible] the production of work

b) Define enthalpy

Ans:

$H = E + PV$

where H = enthalpy

E = internal energy

P = pressure

V = volume

c) Define entropy with its unit?

Ans:

Entropy is a measure of randomness or disorder in the system. The greater the randomness, the higher the entropy.

Its unit is JK^{-1}

[illegible] [illegible] [illegible]
[illegible]

(b) [illegible] rectification and [illegible] through [illegible] with bridge rectifier with [illegible] and draw circuit diagram)

Ans: Bridge rectifier [illegible] through the circuit diagram [illegible] in a bridge [illegible] full wave rectification is shown on fig.

Full wave rectification

The diodes D1, D2, D3, D4 are connected in the four arms of the bridge ABCD. Input AC is applied across the [illegible] of the transformer [illegible] the [illegible] [illegible] is connected between the [illegible] ends A and C of the bridge. The load resistance RL is connected between the other two ends B and D of the bridge.

During the positive half cycle of input AC voltage the end M of the secondary will become positive and the end N becomes negative. The diodes D_1 and D_3 are forward biased while the diodes D_2 and D_4 are reverse biased. Hence the diodes D_1 & D_3 conduct while the diodes D_2 and D_4 do not conduct. The current flows through R_L along ABCD direction.

During the negative half cycle of input AC voltage the end M of the secondary will become negative while the end N becomes positive. The diodes D_2 & D_4 are forward biased while the diodes D_1 & D_3 are reverse biased. Hence the diodes D_2 & D_4 conduct while the diodes D_1 & D_3 do not conduct. The current flows through R_L along CBAD direction.

It is seen that the current flows through R_L in the same direction for both the positive and negative half cycles of input AC voltage. Therefore the output is obtained across the load resistance R_L.

The waveforms for input AC voltage and output DC voltage for a bridge full-wave rectifier is shown in fig.

Intrinsic conductivity and electron mobility [illegible] [illegible] related [illegible]

The free electrons and holes of a semiconductor are in a state of random motion due to the thermal [illegible]. In thermal equilibrium when an electric field is applied the charge carriers drift under the influence of electric field.

The current density due to drift velocity of free electrons is given by:

$$J_n = n e v_n \quad \text{—— (1)}$$

where e is the charge of a free electron, n is the free electron density and v_n is the drift velocity of free electrons.

The current density due to drift velocity of holes is given by:

$$J_p = p e v_p \quad \text{—— (2)}$$

where e is the charge of a hole, p is the hole density and v_p is the drift velocity of holes.

The total current density due to both free electrons and holes is

$$J = J_n + J_p \quad \text{—— (3)}$$

[illegible] is [illegible] denoted by n_i

$$J = [illegible]$$

$$J = [illegible] \quad \text{—— (4)}$$

The conductivity of the semiconductor is defined as the current density per unit electric field

It is given by

$$\sigma = \frac{J}{E} \quad \text{—— (i)}$$

where E is the electric field

Putting the value of J from eq (i) in eq (ii) we get

$$\sigma = \frac{q(n v_n + p v_p)}{E}$$

$$\sigma = q\left(n \frac{v_n}{E} + p \frac{v_p}{E}\right) \quad \text{—— (iii)}$$

Carrier mobility is defined as the drift velocity per unit electric field.

It is given by

$$\mu = \frac{v_d}{E} \quad \text{—— (iv)}$$

where v_d is the drift velocity of charge carriers

For electron mobility is

$$\mu_n = \frac{v_n}{E} \quad \text{—— (v)}$$

Hole mobility is

$$\mu_p = \frac{v_p}{E} \quad \text{—— (vi)}$$

Using eq (v), we get

$$\sigma = q(n\mu_n + p\mu_p) \quad \text{—— (vii)}$$

Q) Define stability factor. What is its value in fixed bias?

Ans) Stability factor for a biasing circuit is defined as the rate of change of collector current with respect to the collector-base leakage current at constant β and I_B.

It is given by

$$S = \frac{\partial I_C}{\partial I_{CBO}}$$

where I_C is the collector current and I_{CBO} is the [illegible] leakage current

Con - II

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① [illegible]

Ans. [illegible]

② [illegible]

[illegible]

③ [illegible]

Ans. [illegible]

→ [illegible]

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(a) [illegible] operator.

Ans: A operator is a rule by which an mathematical which transforms a function into another function [illegible] operator [illegible] by using [illegible] follow [illegible]

[illegible]

(b) Show that $[x^n, p_x] = i\hbar n x^{n-1}$

Ans: [illegible]

$$= i\hbar n x^{n-1}$$

$$[x^n, p_x] = i\hbar n x^{n-1}$$

(c) Explain stationary states.

We know that the [illegible] eigenvalues and that the corresponding probability density for such a function is independent of time called stationary state.

(d) Explain Compton effect.

[illegible]

[illegible] the [illegible] energy [illegible]

[illegible]

magnetic susceptibility

[illegible]

magnetic intensity

[illegible]

Ans: Number of atoms per unit cell (N)

$$N = 8 \times \frac{1}{8} + \frac{6}{2}$$

$$= 4$$

(b) K-space

The reciprocal lattice points in three dimensional ~~space~~ form a reciprocal lattice. Space of the reciprocal lattice space is called K-space.

Q) Why reciprocal lattice is used?

Ans:

Because the length assigned to each vector representing the reciprocal lattice is proportional to the reciprocal of the interplanar spacing of the planes in ordinary space.

(c) The total no. of atoms per unit cell of diamond is 8.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(a) [illegible]

the corresponding [illegible]

[illegible]

[illegible]

(b) Using these [illegible] solution [illegible]

[illegible]

[illegible]

[illegible]

[illegible] solution in general

[illegible]

11) Spontaneous [illegible]

[illegible]

Ans = [illegible]

(3) Define [illegible]

[illegible]

8) What is the [illegible]

Ans [illegible]

[illegible]

Ans = [illegible]

[illegible]

Ans = [illegible]

DSE-2

[illegible]

[illegible]

[illegible] (Hons)

Sub- [illegible]

① What is electric charge? (2)

Ans- Charge is [illegible] change [illegible] responsible for the change [illegible]

② What is conductivity? (2)

Ans- The [illegible] electrically

③ [illegible]

Ans- [illegible]

④ [illegible] unit of velocity? (2)

Ans- [illegible] unit of velocity [illegible]

[illegible]

① What is decay constant? (2)

Ans. Decay constant is the average [illegible] of a radioactive substance. [illegible] of the number of nuclei [illegible] the [illegible] of the total number of [illegible]

Decay constant (λ) = [illegible] / total number of nuclei

② State β-decay? (2)

Ans. β-decay is a spontaneous process in which mass number of nucleus remains the unchanged but atomic number changed by unity.

③ Explain electron capture or (K-capture)? (3)

Ans.- In this process an electron from K-shell of the atom is captured by the nucleus [illegible] and neutrino.

In this case a proton in the nucleus which converted into a neutron [illegible] by capturing an orbital electron. It can be represented

$$ {}_1p^1 + {}_{-1}e^0 \to {}_0n^1 + \nu $$

The general equation is.

$$ \boxed{{}_ZX^A + {}_{-1}e^0 \to {}_{Z-1}Y^A + \nu} $$

Surprise Test

[illegible]

[illegible]

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1)

a) Solve the equation $y\,dx - x\,dy = 0$

Given: $y\,dx = x\,dy$

$$\int \frac{dx}{x} = \int \frac{dy}{y}$$

$\Rightarrow \log x = \log y$

$\Rightarrow y = cx$, where c may be arranged accordingly.

b) Solve $\frac{dy}{dx} =$ [illegible]

[illegible] $\frac{dy}{[illegible]} =$ [illegible] separate the variables.

Now, integrating on both

$$\int \frac{dy}{[illegible]} = \int [illegible]$$

$$\int [illegible]\,dy = \int [illegible]\,dx$$

[illegible]

∴ [illegible] is the required general solution form.

3) $\frac{dy}{dx} = \frac{y+1}{x+2}$ [illegible]

This is separating the variables, and integrating we obtain

$$\int \frac{dy}{y+1} = \int \frac{dx}{x+2}$$

or, $\ln(y+1) = \ln(x+2) + \ln c$

where $\ln c$ is the arbitrary constant of integration.

So, $y+1 = c(x+2)$

which is the required general solution.

4) Find solution of general differential equation with constant coefficient by general method.

Any general method. Let $y = \frac{1}{(D-a)} f(x)$
operating it by $(D-a)$, we get
$(D-a)y = f(x)$

or $\frac{dy}{dx} - ay = f(x)$ . . . . (i)

This is linear differential equation having integrating factor $= e^{-ax}$, hence solution of (i) is given by:

$y e^{-ax} = \int f(x) e^{-ax} dx$

or $y = e^{ax} \int f(x) e^{-ax} dx$ . . . . (ii)

Q) Solve the D.E. $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 0$

Ans:- Given equation can be written as

$(D^2 - 5D + 6)y = 0$

Then, auxiliary eqn for (1) is

$m^2 - 5m + 6 = 0$

$\Rightarrow m^2 - 3m - 2m + 6 = 0$

$\Rightarrow (m-3)(m-2) = 0$

$\therefore m = 3, 2$

Hence the required solution is $y = C_1e^{3x} + C_2e^{2x}$

Q) Show that $\lim_{\theta \to 0} \frac{\tan 2\theta}{\theta} = 2$

Ans:- $\lim_{\theta \to 0}\left(\frac{\tan 2\theta}{\theta}\right) = \lim_{\theta \to 0} \frac{\sin 2\theta / \cos 2\theta}{\theta}$

$= \lim_{\theta \to 0}\left(\frac{\sin 2\theta}{2\theta}\right) \times 2 \cdot \lim_{\theta \to 0} \frac{1}{\cos 2\theta}$

$= 1 \times \frac{2}{1} = 2$ $\left[\because \lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1, \lim_{\theta \to 0} \cos\theta = 1\right]$

Q) Find $\lim_{x \to 0} \frac{x^2 + 2x}{x}$

Ans:- $\lim_{x \to 0} \frac{x^2 + 2x}{x} = \lim_{x \to 0} \frac{x(x+2)}{x}$

$= \lim_{x \to 0} (x+2) = 2$

Physics Test

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1) Define Elasticity.

Ans - In economics, elasticity measures the percentage change of the one economic variable in response to a change in another. If a greater price elasticity of demand is -2, a 10% increase in price causes the quantity demanded to fall 20%.

2) Define stress and write the unit.

Ans - Stress is defined as the total force applied per unit area. ~~[illegible]~~.

⇒ The unit of stress is N/m² (Newton per meter²)

3) Explain bulk modulus (K).

Ans - The bulk modulus of a substance is a measure of how resistant to compressibility that substance is. It is defined as the ratio of the infinitesimal pressure increase to the resulting relative decrease of the volume.

$$K = -V\frac{dP}{dV}$$

1) [illegible] [illegible] strain and [illegible].

Volume Strain:-

Volume Strain is defined as ratio of change in volume of the original volume w.r.t. [illegible] of the hydraulic [illegible].

Linear Strain:-

Linear Strain is defined as the ratio of change in length of the body due to the deformation to its original length in the direction of the force.

2) Define surface tension write its SI unit and dimension.

Ans:- Surface tension is the tendency of liquid surfaces at rest to shrink into the minimum surface area possible.

⇒ SI unit of surface tension is N/m (Newton per meter)

⇒ Dimension of surface tension is $T = [ML^0T^{-2}] = [L^{-1}]$

3) Define co-efficient of viscosity write its unit & dimension.

Ans:- The co-efficient of viscosity is a measure of resistance to flow of the fluid.

⇒ The unit of co-efficient of viscosity is [illegible] - poise

⇒ Dimensional formula of viscosity is $[ML^{-1}T^{-1}]$

7) What is Cantilever?

Ans:- A member of a rigid structural element that extends horizontally and is supported at only one end.

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Name : [illegible] [illegible] [illegible]

Subject - political science ([illegible])

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Name — Sibani Jena
Subject — Political Science
Roll no - 52 , Gen - 3

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Rajdhani Degree College
Name - [illegible] Parida
Roll No - [illegible]
Subject - Zoology Core-[illegible]

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10

1)

a) Nucleotide (NA) with protein. ok

b) DNA Helicase

c) Reverse transcriptase

3.5

2)

b) RNA Priming

RNA priming means by which the synthesis of one strand is initiated. The RNA strand provide 3' hydroxyl group to which incomplete nucleotide are added

1.5

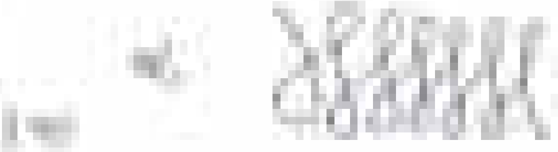
a) RNA primer is catalysed by enzyme called primase. The resulting RNA is stretching from a position not [illegible] found of the synthesised DNA.

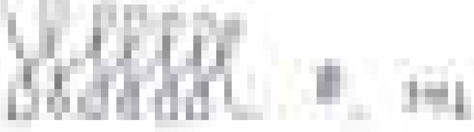
b) All the RNA from the removal of RNA is replaced with DNA.

c) the process of removal of RNA and replaced with DNA is continuous in lagging strand in association with [illegible] Okazaki fragment synthesis

d) Structure of Globular [illegible]

The molecule of Globular [illegible] Consist α-2 ribosomes forming polysomes. [illegible] eukaryotic translation factor joined with the polysomes. The α-β combination is followed by [illegible] chain. The mRNA from which the protein is formed called globin mRNA





total 574

Difference between prokaryotic and eukaryotic and translation

[illegible]

1 They don't have nucleus and don't contain cell organelles like mitochondria, Golgi body etc.

1 They have nucleus and contain cell organelles like mitochondria, Golgi bodies and chloroplast and [illegible]

-> Transcription and translation is continuous	-> Transcription and translation is discontinuous

Ribosome

-> Ribosome is 70S type (30S + 50S)	-> Ribosome is 80S type (80S + 60S)

Factors [Initiation]

-> IF_1, IF_2, IF_3	-> eIF

mRNA

-> The mRNA is polycistronic i.e. having many start point thus makes several type of corresponding protein.	-> The mRNA is mono cistronic i.e. having only one start point thus makes only one type of protein

tRNA

-> The initiator t-RNA is N-formyl methionine t-RNA	-> The initiator t-RNA is methionine t-RNA

Amino acid

-> The first amino acid of the chain is N-formylmethionine	-> The initiator amino acid of the chain is methionine.

Factor (initiation)

→ The initiation factor are IF1, IF2 & IF3 which helps in translation in prokaryotes	→ The initiation factor are many but 4 are important and eIF1, eIF2, eIF3, eIF4A, eIF4B [illegible] eIF4D, eIF4F, eIF4G which helps for initiation in eukaryotes

Capping

→ Cap dependent	→ Cap independent.

Life period

→ The mRNA which produce protein has very short half life period i.e. 2 minute (2-4 minute)	→ The mRNA which produce protein have very long life period i.e. hour to day.

Initiation codon

→ The coding distance may be slightly different the initiation is encoded by AUG and AUG may not be needed.	→ The coding distance is normal i.e. AUG.

3.4

[illegible]
Name : [illegible]
Roll no - [illegible]
Subject : Zoology (Core - [illegible])

1)
a) 23 pairs.
b) Gregor Mendel
c) 3:1

7

2)
a) Maternal effect

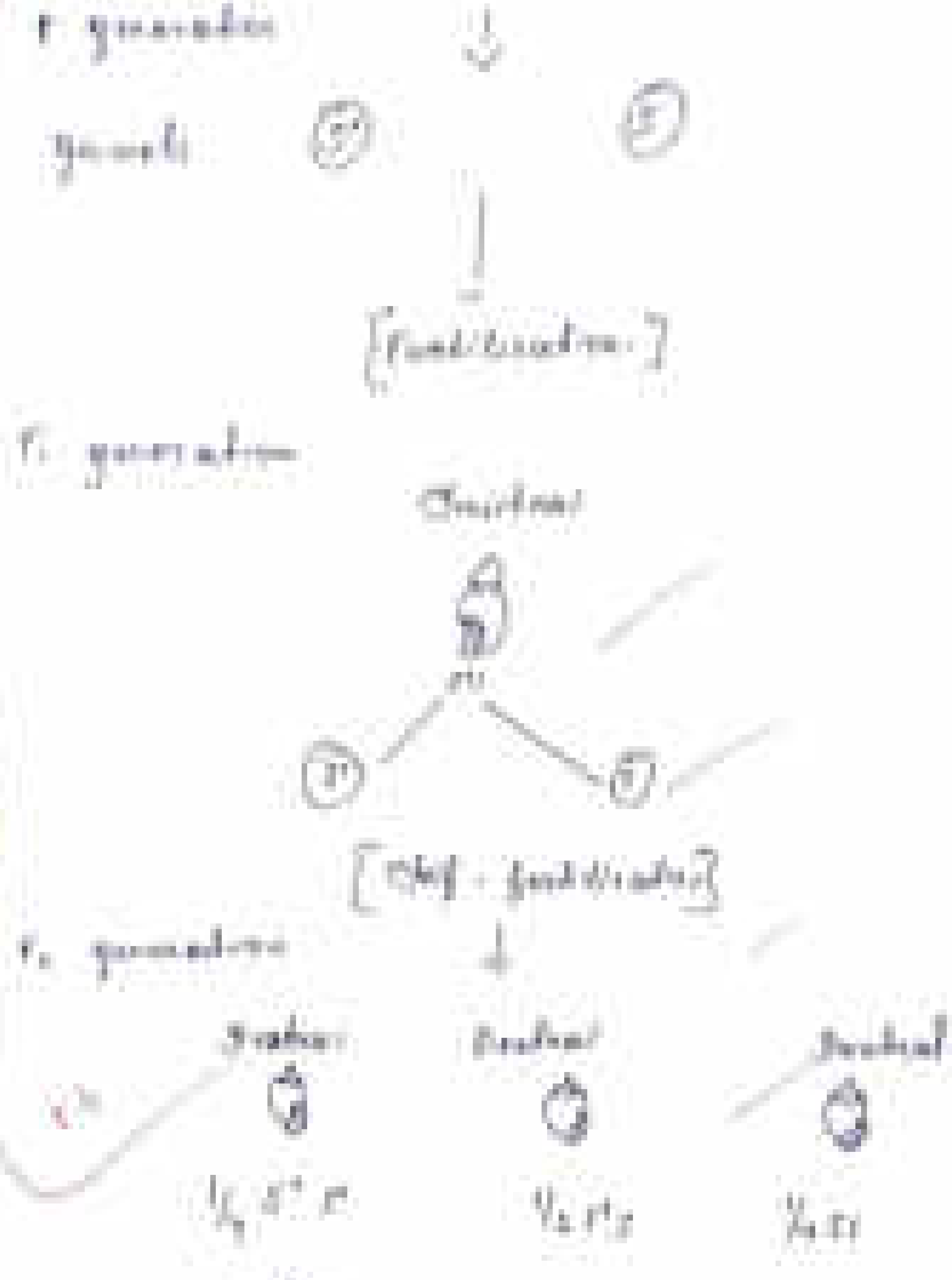
[illegible]

Maternal effect is a situation where the phenotype of an organism is not only determined by environment and its genotype, but also by the environment and the genotype of mother.

- The genotype is inherited from both parents but the phenotype is identified by mother's genotype.

(Dextral)

(Sinistral)



4) [illegible] element in [illegible]

→ The [illegible] element was first [illegible] in [illegible]

(·) [illegible]

transposable elements. Are really discovered in recognised in 1983. She was awarded on a medicine physiology.

→ She studied this in Maize, these mutation are due to the movement of gene.

→ The transposable elements genes move from one point to another point of a chromosome

c/c - white kernel

C/C - purple kernel

→ When D is added to C element then it produce purple pigment with spot.

→ Here D is non-autonomous element and C is autonomous element

→ Here Ac = Activator, Ds = Dissociation

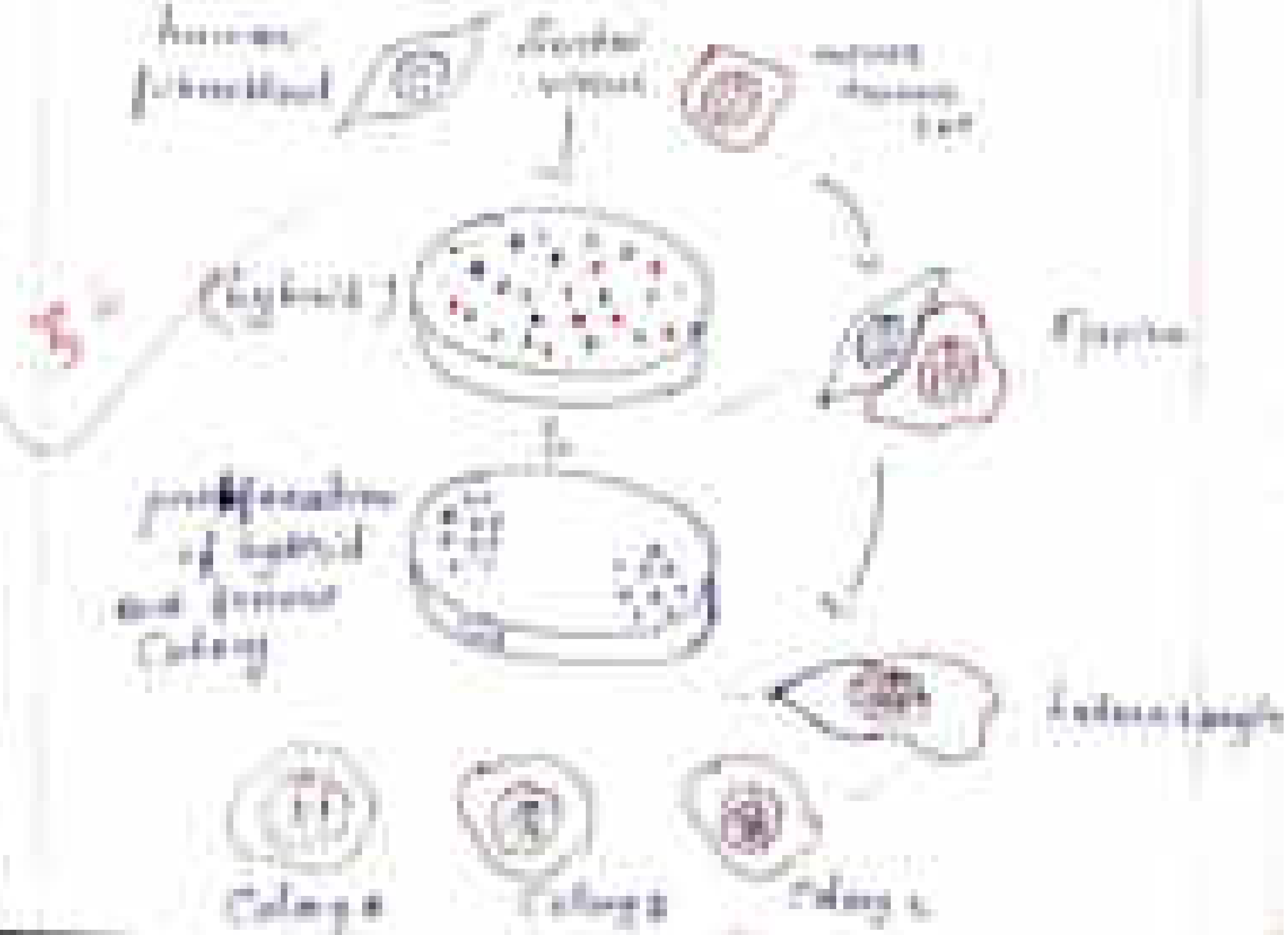
→ The ~~Ac~~ definition only identified when Ac is present, in the experiment the kernel colour is changed to kernel colour in the presence of 'c' locus

⑥ Somatic cell hybridization

Fusion of diploid somatic cell of plants and animal belonging to diff cell line, when made not to an interspecific somatic cell fusion, in the medical scientific somatic cell are used for hybridization and several process separately.

Kuster (1909) has describe the fusion of plant cells [illegible] during mechanical plant cell isolation of protoplast [illegible] the fusion of cell was given by [illegible] in [illegible] during Culture experiment of two strain of mouse cell of which two differ in morphology and karyotype.

Under the influence of Sendai virus, human fibroblast cell and mouse tumour cell grow together in Culture until fuse to form heterokaryon, in which the nuclei fuse because the cells continuing to proliferate, these chromosome mytotic division human chromosome are gradually lost resulting in number of Colony is formed with human chromosome which are identifiable. these cell then can be screened for the presence of various human biochemical markers, which are then assigned to to the retained chromosome.



9/10

[illegible] [illegible] [illegible]
Name - [illegible] [illegible]
Roll No. - [illegible] ([illegible]) [illegible]
Subject : [illegible]

1)
a) Roll 6
b) Gross motor & physio
c) In [illegible] there is contrary

2)
a) Rheumatoid Arthritis Rheumatoid Arthritis
[illegible]

Arthritis is a chronic disorder causes inflammation swelling and pain in and around the joint and can affect other body organs.
It usually affect the hands and feet joint but it can occur in any joint it usually
(1½) involves the same joints on both sides of the body.

Symptoms

- pain or tenderness in more than one joint
- stiffness in more than one joint
- swelling in more than one joint

⊃ Ch
⊃ Symmetrical joint involvement
⊃ Low grade fever
⊃ Appetite loss
⊃ Weight loss
⊃ Tiredness,
⊃ Joint deformity

Treatment

Corticosteroids reduces pain and inflammation and may help slow joint damage, but they cannot cure RA.

4) Sandwich ELISA

The procedure is directed towards the detection of antigen. In this method, the antibody is immobilized in a microtiter well, the antibody reacts to an antigen containing sample. Then [illegible] for washing the well & second enzyme linked antibody specific for the antigen is mixed with the bound antigen. The coloured reaction is measured following washing of any free unbound antibody.

5) Structure and function of different types of immunoglobulin

[illegible]

The five primary classes of immunoglobulins are IgG, IgM, IgA, IgD and IgE. These are distinguished by the type of heavy chain found in the molecule. IgG molecules have heavy chains known as gamma chains; IgMs have mu chains; IgAs have alpha chains; IgEs have epsilon chains; and IgDs have delta chains.

- Structure of IgG

-> Y-shaped or T shaped. It found of 4 polypeptide chain. L and H chain are bind together by disulfide bond.

-> Each [illegible] Consist of [illegible].

Function

-> Maternal IgG (except subclass IgG2) It is only immunoglobulin that can cross the placental barrier and enter the fetal circulation. Maternal IgG is [illegible] from the infection of new borns and offers passive immunity to the neonates during the first few months of life.

- IgG molecule involved in the opsonization process

-> IgG involves in type II and type III hypersensitivity

Structure of IgA

-> IgA is an glycoprotein with have 4 polypeptide Chain structure

-> 2 light chain and 2 heavy chain. Its [illegible] type that same amount of IgA than IgG.

Function

-> Secretory IgA provides an important line of defense against microbial invaders at mucosal surfaces. These

IgA is referred to as "mucosal" guardian antibody.
→ First line of mucosal defence.
provides passive immunity to new born.
→ The IgA can activate the alternative complement pathway.

Structure of IgM

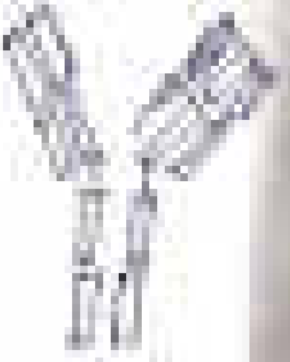
The secretory IgM is a pentamer of five monomeric units of IgM that are held together by disulfide bond & J chain at the C-terminal region of heavy chain.

Function

- IgM is the first immunoglobulin which effectively activates the complement system.
- The presence of IgM in foetus or newborn indicates congenital infection.
- IgM exhibits other biological properties like agglutination, opsonization, cytolysis etc.

Structure of IgD

The IgD is a Y-shaped glycoprotein which has a monomeric similar structure, 2 light chains and 2 heavy chains (α, δ). Each chain has 2 domains while H chain has 4 domains.

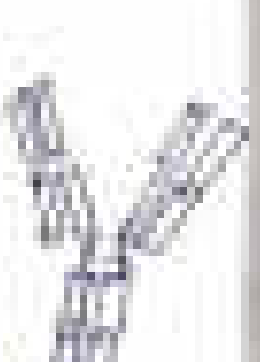


Function

- Act as receptor.
- resistant to proteolytic degradation.
- helps in cytokines and chemokines.

Immunoglobulin Structure of IgE

The structure of IgE is similar to that of IgA and IgG but contains an extra CH domain and without any hinge.



Function

- It provides immunity against helminth, worms and protozoan parasites.
- It plays important role in Type I hypersensitivity reaction, releasing mediators of inflammation.

9/
10

Rangia Degree College
Name : [illegible]
Roll No : [illegible]
Subject :- Animal Behaviour

1)
4) [illegible] ___
5) [illegible] ___
6) [illegible] : ___

2) Summation, in physiology, the additive effect of several electrical impulses on a neuromuscular junction between a nerve cell and a muscle cell. Individually the stimuli cannot evoke a response but collectively they can generate a response.

Summation is the process of adding things up. In the case of nervous system, it is about adding up the effect of multiple stimuli that may even all individually subthreshold. Or that together they are suprathreshold and are able to generate an action potential.

3) [illegible]

[illegible] are those signalling molecules which

Driven with reference to the direction of stimu-
In this type of orienting mechanism the gradient
of stimulus is of utmost importance. Interesting
experiments have been carried out with simple
[illegible] [illegible] flies. It has been observed that
If these [illegible] are removed away from
the water to a dry spot, they head straight back
to water. These flies were placed in closed
glass tubes and kept away from the sun or
dry heat. It was noted that flies always
gathered in that part of the glass tube which
was closest to sun. It has been established
that along with moisture it was also
the position of sun which was utilized by
flies to orient themselves towards the [illegible]
There are a variety of taxes depending upon
the relationship of stimuli and the receptors.

(8)

Humans can exhibit all these types of
[illegible] with these types of imprinting filial,
[illegible], and taxes. Filial imprinting [illegible]
humans to [illegible] [illegible] get different
through months to [illegible] period.

Imprinting — a definition in psychology
is an inherited [illegible] trait that [illegible]
[illegible] as a means of [illegible] imprint is defined
as a behavioural trait that [illegible]
made [illegible] after being born
when they develop an extremely close
bond with the animal they first meet

normally their parents.

Types

1. Filial imprinting

It is the most widely known type of imprinting that influences the connection between young and their parents or siblings. This type of behavioural bond allows the young to strongly respond on their parents as a means of survival. This imprint bond also ensures that the young will recognize their parent or even different member within their species which is useful for reproduction.

2. Sexual imprinting

Sexual imprinting is a type of behavioural trait that affects an animal's inclination toward a sexual mate from learned behavior usually very early in life. (1.2) This type of imprinting behavior influences mate selection later in life. It can be altered to make an animal prone to characteristics or choose against specific features. Psychologists are exploring whether imprinting is a factor in human mate choice.

3. Audio imprinting : filial and sexual imprinting may also involve audio imprinting

Name- [illegible] [illegible]
Class- second year
Sub- zoology
Paper- [illegible]
Roll no- [illegible]

8> Larval form of Hemichordata: tornaria.

9> Catadromous migration refers to movement of fish sea water to fresh water.

10> The petromyzon larva is called ammocoete.

11> Anadromous migration:

1> When migration occurs from sea to freshwater for spawning, it is called anadromous migration.

2> Adults of anadromous fishes live and feed in ocean waters but their spawning grounds lie in the freshwaters of rivers.

3> Salmons, sturgeons, Hilsa and lampreys are some of the marine fishes that undertake anadromous migration to spawn in rivers.

4> Ex- Atlantic salmon, Hilsa shad, Tol shad, Salmon, Blue back herrings, sturgeon, paradise fish.

12> Respiratory organ in fishes:

General characters of amphibia:

i) Amphibians are cold blooded vertebrates and most of them undergo hibernation during winter and aestivation during summer.

ii) They may be aquatic, terrestrial or both.

iii) The body is divided into head, neck, trunk & tail.

iv) Skin is thin, moist and glandular. Skin acts as a respiratory organ.

v) Amphibians show two pairs of limbs by which they can swim in water and jump or walk on the land.

vi) The limbs if present are supported by girdles.

vii) Exoskeleton is absent.

viii) A pair of nostrils which open into buccal cavity.

ix) Respiration by skin, gills or lungs.

x) Skull is dicondylic. Ribs are absent.

xi) Digestive system is well developed.

xii) Alimentary canal opens into cloaca.

xiii) Heart is 3 chambered with 2 auricles and 1 ventricle.

xiv) Eyes are provided with movable eyelids.

xv) Ear consists of internal tympanum.

xvi) Fertilisation is generally external, but sometimes internal.

xvii) Eggs are mesolecithal & covered by jelly covering.

xviii) Cleavage is holoblastic & unequal.

xix) Sexes are separate.

xx) Development is indirect.

3> b> Respiratory organ in fishes

Fishes mainly depends upon pharyngeal gills for aquatic respiration, however other also organs to supplement gill respiration.

a> Buccal pharyngeal epithelium

→ In fishes the epithelial lining of buccal cavity & pharynx is usually highly vascular and permeable to gases in water.

→ But the symbranchus and the mud skipper can fill their oral and pharyngeal cavity with air & thus take O₂ directly from atmosphere.

b> Pelvic fins

→ In Amazonian lung fish, lepidosiren during breeding time, the pelvic fins of male become enlarged and bear filamentous vascular outgrowths which provide fresh O₂ to the guarded eggs.

[illegible] [illegible]
Name - [illegible] paul
Class - [illegible] 2nd year
Sub - Zoology
Paper - core - 6
Roll No - [illegible]

1) **Sarcomere**: Is a unit of muscle fibre.

2) The cells of a bone is known as osteocytes.

3) Active form of thyroid hormone Triiodothyronine.

4) Ultrastructural appearance of skeletal muscle

1) The striated appearance of skeletal muscle fibre is due to the organisation of 2 contractile protein - actin and myosin.

2) The functional unit of contraction in a skeletal muscle fibre is the sarcomere, which runs from Z line to Z line. A sarcomere is broken down into a number of sections.

Z line - where the actin filament are anchored.

M line - where the myosin filament are anchored.

I band - the ~~length of myosin filament~~ may contain only ~~overlapping~~ actin filament.

A band - the length of myosin filament may contain actin filament.

H zone - contain only myosin filament.

[Epimysium layer]

5) Molecular and chemical basis of muscle contraction:

Muscle contract by the interaction of protein filaments are made up of myosin and actin molecule. The head part of each myosin & actin molecule is thought to interact with the actin filament in a cyclic manner driven by ATP hydrolysis with each stroke of the cycle causing about 10 nm of movement.

Contractile process:

In resting state the muscle fibre remain relaxed because the actin and myosin don't form actomyosin ATP complex as they carry similar electric charge. The calcium ion concentration is maintained in the sarcoplasmic reticulum.

STEP-I: Depolarisation of Sarcolemma.

When a nerve impulse arrives at the junction of nerve ending in the muscle, the sarcolemma of that muscle fibre is depolarised.

physical change

Step 2: Release of Ca^{2+} ion

The depolarisation of sarcolemma is transmitted to the sarcoplasmic reticulum and causes release of Ca^{2+} ion from sarcoplasmic reticulum.

Step 3: Conformational change in actin:

The released Ca^{2+} ion binds to T_nC subunit of troponin. This produces conformational change in tropomyosin & actin in actin filament, preparing it to contact with Atp.

Step 4: Formation of actomyosin complex:

The cross bridge of meromyosin binds to a globular subunit of the actin filament. Actin activates myosin-Atp ase which causes release of energy from Atp required for the movement of myosin cross bridge.

Step 5: Breaks of actin myosin bridge:

Atp binds to myosin bridge breaking the actin-myosin bridge and so allows the movement of cross bridge leading to the sliding of thick & thin filaments past each other.

Relaxation:

With the release of motor excitation, the sarcolemma develops resting potential and the sarcoplasmic reticulum reabsorbs Ca^{++} ions from the sarcoplasm. With the decline of Ca^{++} ions myosin ATPase activity is inhibited, the cross bridges are broken and troponin releases Ca^{++} ions leading to the recovery of resting state.


THE ODISH
ARAT SCOUT
AMAJEE C