SEMINAR NO - 2

09

The Second Departmental Seminar is held in The Department on dt 20/08/1800 Topic "An overview of Population Explosion"

The Resource Person were Dr. Sujata Kumari Patra
Dept. of Education
B P Women's College, Digapahandi

Dungyadhar Pradhan,
Lect. in Education
Khemundi College, Digapahandi

Dy (four) Nos of Papers were Presented by →

① Nalini Rana +3 2nd yr Arts
② Bhabani Jena +3 1st yr Arts
③ Mithun Sethy +3 1st yr Arts
④ Amita Dalai +3 3rd yr Arts

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 15 - 09 - 18

It is informed to all the Students of +3 1st yr, 2nd yr 3rd yr to attend the Department Seminar (Topic :- An overview of Population Explosion on 20/9/18 by 11 A.M at room no- 110

Organizing Secretary

Principal
RAMAJEE MAHAVIDYALAYA
BHISMAGIRI GANJAM

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC " An Overview of Population Explosion"
Date – 20/09/18

1. Lighting the candle by Principal, Guest and respective :-
2. Puspamalya to Lord Jaganath (Santipatho)
3. Chair addressed by
   Prof Kumari Priyadarsani Pradhan Dept.of Edn.
4. Opening song by : Miss Sngita Mohanty & Miss Nalini Rana
5. Paper presented by the students :
   Miss Nalini Rana,+3 2nd yr.Arts
   Miss Bhabani Jena ,+3 1st yr.Arts
   Mr Mithun Sethy +3 1st yr Arts
   Miss Asmita Dakua, +3 3rd yr Arts
6. Chief Guest :- Dr. Sujata Kumari Patra,
   Biju Pattanik Womens College,Digapahandi
7. Chief Speaker : - Sri Durjyadhan 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-Eduaction

Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following students

1. Aimito Baksa
2. D. Sastan Dora
3. Vikash Nayak
4. Sambhu Uddin
5. Sanjana Behera
6. Sangita mohanty
7. Abhimanyu Samantray
8. Nalini Ranja
9. Rajesh mohanty
10. Bhabani jena
11. Jajiti kumar gauda
12. Sagar Behera
13. K. Tikina Patra
14. Nilendal gauda
15. Umakila Sahu
16. Rasmanjali Gauda
17. Ramakrida mohanty
18. Sonali gauda
19. Trumuri nayak
20. Sunita Patra
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22. Babrubahana Gauda
23. Rosni patra
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25. Sandhay rani Pradhan
26. Chinmayee kumari Gauda
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28. Rasmi Pattanayak
29. Babu Bishoyi
30. Lili Swain
31. Samikar Raha
32. Sibasankar Gauda
33. Chinmayi kumari Gauda
34. Mata Hansula
35. mithun
36. Sunita kumari Pala
37. Srikanta Gauda
38. Anil kumar Mahakuda
39. Liza pradhan
40. G. Rahul Reddy


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Prof KL
Org

# An Overview of Population explosion

Introduction The rapid growth of the world population over the past one hundred years results from a difference between the rate of birth and the rate of death. The human population will increase by 1 billion people in the next decade. This is like adding the whole population of china to the world's population. The growth in human population around the world affects all people through its impact on the economy and environment. The current rate of population growth is now a significant burden to human well being. Understanding the factors which affect population growth patterns can help us plan for the future. The purpose of this unit is to examine some important factors about overpopulation.

In the Past infant and childhood deaths and short life spans used to limit population growth. In today's world, thanks to improved nutrition, sanitation and medical care more babies survive their first few years of life. The combination of a continuing high birth rate and a low death rate is creating a rapid population increase in many countries in Asia, Latin America and Africa and people generally lived longer. over-population is defined as 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 birth rates and death rates were about the same. Keeping the population stable. People and many children but a large number of them died before age five. During the Industrial Revolution a Period of History in Europe and North America where there were great advances in science and technology. The success in reducing death rates was attributable to several factors :- (1) Increase in food production and distribution (2) Improvement in public health (water and sanitation) and (3) Medical technology (Vaccines and antibiotics) along with gains in education and standards of living. Within many developing nations 7. Without these attributes present in many children's lives they could not have survived common diseases like measles on the film. People were able to fight and cure deadly germs that once killed them in addition, because of the technology people could produce more and different kinds of food. Gradually over a Period of time - these discoveries and Inventions spread throughout the world lowering death rates and improving the quality of life of most people.

The Second most important factors is Vaccinations. As far back as 1800 Scientists knew how to use Vaccines to protect people from infectious

SEMINAR NO - 2

09

The Second Departmental Seminar is held in The Department on dt 20/08/1800 Topic "An overview of Population Explosion"

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Lect. in Education
Khemundi College, Digapahandi

Dy (four) Nos of Papers were Presented by →

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④ Amita Dalai +3 3rd yr Arts

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 15 - 09 - 18

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Organizing Secretary

Principal
RAMAJEE MAHAVIDYALAYA
BHISMAGIRI GANJAM

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC " An Overview of Population Explosion"
Date – 20/09/18

1. Lighting the candle by Principal, Guest and respective :-
2. Puspamalya to Lord Jaganath (Santipatho)
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Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following students

1. Aimito Baksa
2. D. Sastan Dora
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5. Sanjana Behera
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9. Vc

Prof KL
Org

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The Second most important factors is Vaccinations. As far back as 1800 Scientists knew how to use Vaccines to protect people from infectious

Seminar No - 3

The third Departmental Seminar is held in the Department on dt. 16/12/19 on topic "Education is an Instrument of Social change"

The Resource Person was Dr. Rajesh Kumar Padhan
Dept. of Education
CHSE(E) Mahavidyalaya, CM
(2) Durgadhan Purohit Lect-in-Edn
Khemundi College, Digapahandi

By (Four) Nos. of Paper Presented were -
(1) Ramesh Mahakuma
(2) Narayan Lenka
(3) Sewak Rath
(4) Dipti Rani Sahu

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 14.12.2019

It is informed to all the Students of 1st 2nd 3rd yr 3rd yr to attend the Department Seminar (Topic - Education is an Instrument of Social change on 16-12-2019 by 11 AM at room no-

Organizing Secretary

PRINCIPAL
RAMAJEE DEGREE MAHAVIDYALAYA
BISMAGIRI, GANJAM

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC "Education is an instrument of Social Change"

Date - 16/12/

1. Lighting the candle by Principal, Guest and respective :-
2. Puspamalya to Lord Jaganath (Santipatho)
3. Chair addressed by
   Prof Kumari Priyadarsani Pradhan Dept.of Edn
4. Opening song by : Miss Sngita Mohanty & Miss Nalini Rana
5. Paper presented by the students :
   Mr Ramesh Maharana,+3 3rd yr.Arts
   Mr Narayan Gouda ,+3 3rd yr.Arts
   Miss Sonali Ratha +3 3rd yr Arts
   Miss Dipti Rani Sahu, +3 3rd yr Arts
6. Chief Guest :- Dr. Rajesh Kumar Patra, Dept.of Edn.
   Chikiti Mahavidyalaya, Chikiti
7. Chief Speaker :- Sri Dirjyadhan Pradhan, Dept.of Edn.
   Khemundi College,Digapahandi
8. Speech by President : Prof. Raghunath Nayak,Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
   Dept.in-Eduaction

Prof Kumari Priyadarsani Pradhan
Organising Secretary

The following Students alone Present there

(1) Ramesh Maharana
(2) Nalini Rana
(3) [illegible]
(4) Prabhangini Gouda
(5) Milirani Behera
(6) Usha Nayk
(7) [illegible]
(8) M. Dhanishtri Patra
(9) Sunita Behera
(10) Sandhyarani Pradhan
(11) Soumita Dixit
(12) Sonali Katha
(13) Nikita Nayak
(14) Pushpanjali Gouda
(15) Tejaswi Behera
(16) Sunaleha Behera
(17) Dipti rani Sahu
(18) Sangita Mohanty
(19) Sonali Gouda
(20) Sangita rani Router
(21) D. Santosh Dora
(22) Pitabas Dhuryan
(23) [illegible]
(24) Rudu Rishoyi
(25) P. Madhuri Reddy
(26) A. Payal Reddy
(27) Sunanda Behera
(28) Hamida Dakua
(29) Nilanjana Gouda
(30) Mitakti Gouda
(31) [illegible]
(32) Kanha Charan Sahu
(33) Mamata Pradhan
(34) Rahit [illegible]
(35) Pagesh Mohanty
(36) Somanya Rani Panda
(37) [illegible]

Photo Copy

# Education is an Instrument of Social change

"Education is the most powerfull weapon which you can use to change the world" Education is the medium through which we can change the world. It helps us to turn weakness into strength, failure into success. It helps us in identifying problems present around us in our society and also helps us in searching for their solutions.

It helps us in increasing the mental ability of a person which in turn changes the way a person thinks that results in the change of pattern of social relationship and hence it may cause social changes. one of the main impetus of education is to change the attitude, thinking and lifestyle of a person.

According to "Britannica Social change refers to the alteration of mechanisms within the social structure, characterized by changes in cultural symbols, rules of behaviour, social organizations, or value systems.

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

According to Collins Dictionary reform consists of changes and improvements to a law, social system or institution. All the reformers felt the need of a strong and sound education system for social change. Education brings change in every aspect of a Person's life and hence Education can be regarded as the perfect instrument for social change.

Our Indian history had a number of important and notable social reforms like Swami Vivekanand Raja Ram Mohan Roy, Rabindra Nath Tagor and Mahatma Gandhi who ~~take~~ took an important role in the Process of bringing out social changes, many reform movements were led by these reformers.

Seminar No - 3

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Dept. of Education
CHSE(E) Mahavidyalaya, CM
(2) Durgadhan Purohit Lect-in-Edn
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By (Four) Nos. of Paper Presented were -
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OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 14.12.2019

It is informed to all the Students of 1st 2nd 3rd yr 3rd yr to attend the Department Seminar (Topic - Education is an Instrument of Social change on 16-12-2019 by 11 AM at room no-

Organizing Secretary

PRINCIPAL
RAMAJEE DEGREE MAHAVIDYALAYA
BISMAGIRI, GANJAM

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC "Education is an instrument of Social Change"

Date - 16/12/

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Prof Kumari Priyadarsani Pradhan
Organising Secretary

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(3) [illegible]
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(5) Milirani Behera
(6) Usha Nayk
(7) [illegible]
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(37) [illegible]

Photo Copy

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21

Seminar :-

The fourth Departmental seminar will be held in the Department on dt 17-04-21 on the topic "Standardization test"

Name & Roll no of Seminar topic :-

(1) Dr. Rajesh Kumar Dalai
Chitta Mahavidyalaya, Asurali

(2) Dr. Sujata Kumari Patra
B.P.U College Digapahandi, Ganj.

1st (Hons) Nos of Paper presented name -

(1) Bhabani Jena +3 2nd yr Arts
(2) Mithun Sethy +3 2nd yr Arts
(3) Kajal Bisoyi +3 2nd yr Arts
(4) D. Sugyani Bera +3 2nd yr Arts
(5) Chinmayee +3 2nd yr Arts.

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 16-04-21

It is informed to all the Students of +3 Ist yr 2nd yr Ind yr to attend the Department Seminar (Topic - Standardization of a test) on 17-04-21 by 11 AM at room no- 110

Organizing Secretary

PRINCIPAL
RAMAJEE DEGREE MAHAVIDYALAYA
BHISMAGIRI, GANJAM

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

## TOPIC - " Standardization of a Test "

Date – 17-04-2021

1. Lighting the candle by Principal, Guest and respective :-
2. Puspamalya to Lord Jaganath (Santipatho)
3. Chair addressed by
   Prof Debadatta Panda,Lect.in-Odia.
4. Opening song by : Miss Sugyani Dora & Madhusmita Bishoy
5. Chief Guest :- Dr. Rajesh Kumar Patra,
   Chikiti Mahavidyalaya,Chikiti
6. Chief Speaker : - Dr. Sujata Kumari Patra,
   Biju Pattanik Womens College,Digapahand
7. Speech by President : Prof. Raghunath Nayak,Principal
8. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
   Lect.in-Eduaction

Prof Kumari Priyadarsani Pradhan
Organising Secretary

Ramajee Mahavidyalaya Bhimagiri ,Ganjam, Odisha

**Student Attendance sheet**

**Name of the event** - Departmental Seminar of Education

**Topics** Standardization of a Test

| Sl.no | Name of the student | Phone no. |
|---|---|---|
| 1 | Kajal Bisoyi | [illegible] |
| 2 | Sunita Ku Behera | [illegible] |
| 3 | [illegible] | [illegible] |
| 4 | Madhusmita Behera | [illegible] |
| | Sucita Bisoyi | [illegible] |
| | [illegible] | [illegible] |
| 8 | [illegible] | [illegible] |
| 9 | Anadi Dash | [illegible] |
| 10 | [illegible] | [illegible] |
| 11 | [illegible] | [illegible] |
| 12 | [illegible] | [illegible] |
| 13 | [illegible] | [illegible] |
| 14 | Kumari [illegible] | [illegible] |
| 15 | Tanisi Gouda | [illegible] |
| 16 | Laxmi Kumari Behera | [illegible] |
| 17 | Nikita Gouda | [illegible] |
| 18 | Soniya Behera | [illegible] |
| 19 | Ranita Kr. Nedha | [illegible] |
| 20 | Ubi Suna | [illegible] |
| 21 | Puja Tanaya | [illegible] |
| 22 | Mini Sahu | [illegible] |
| 23 | Debadarsan Gouda | [illegible] |

Ramajee Mahvidyalya Bhismagiri ,Ganjam, Odisha

Student Attendance sheet

Name of the event - Departmental Seminar of Education

Topics- Standardization of a Test

| Sl.no | Name of the student | Phone no. |
|---|---|---|
| 1 | Sumita Mohanty | 8984062738 |
| 2 | Chanda Sahoo | 9238653221 |
| 3 | Emmanuel Gouda | 7205618575 |
| 4 | Mamo Behera | 9437264230 |
| 5 | Ela Lenka | 8455121425 |
| 6 | Manisha Patra | 8917419487 |
| 7 | Lopamudra Raha | 7328037399 |
| 8 | Alka Jena | 7064775796 |
| 9 | Bibhuprasad Swain | 9777276[illegible]19 |
| 10 | Sweta Sahoo | 9861123693 |
| 11 | Sudam Kumar Sethi | 9668[illegible]5 |
| 12 | Kanaka Mohanty | 8763555601 |
| 13 | Jagadish Biswal | 9938132821 |
| 14 | Subhashree Gouda | 6372[illegible]8 |
| 15 | Bibhuprasad Jena | 6372208321 |
| 16 | Amit Jena | 6371[illegible]337 |
| 17 | Mithun Sahoo | 8763255166 |
| 18 | D. Sushant Jena | 7735581046 |
| 19 | Madhusmita Bishoyi | 7008816553 |
| 20 | [illegible] | [illegible] |


DEPARTMENT OF EDUCATION
SEMINAR


Standardization
Of a Test
DEPARTMENT OF EDUCATION
VIDYALAYA.BHISMAGIRI (GM)

Standardized test

* Standardized tests are tests administered in a consistent manner and is typically described as the collection and analysis of information about how an entire student's knowledge was measured. This means that a particular group of students will take the same test that will be scored similarly for each student to ensure fairness for the rest of the group to see how well the student performed.

The federal law known as "NO CHILD LEFT BEHIND" or NCLB was created to hold schools accountable for what students learned throughout the school year, states were required to set goals and objectives for students standing in grade level and at the end of the year must evaluation students met the required goals and objectives. These standardized or high stakes tests with information about student achievement the tests can also determine whether or not students are promoted to the next grade level. additionally teachers and/or schools with high numbers of students who do not perform well on the end of year tests could face negative consequences as a result.

There are many types of assessments used by school systems in the United States.

Let's take a look at a few of the most commonly Used standardized tests.

## Aptitude tests →

Aptitude tests measure what a student understand about a particular subject area for example → the Scholastic Aptitude test measures student's knowledge in the areas of reading, math, and essay scores on the SAT are used by Colleges to make admission decisions. These typically show Student's abilities to be successful in higher education settings.

## Intelligence tests →

Typical intelligence tests are Used to determine a students whether a student's scores are high enough for the student to be placed in a gifted and talented program or low enough to be referred for special education. These Types of tests are generally administered by a psychologist or any one else trained to give the test and interpret the results.

Tamara Rajadurai Pandian
Dept in - Education

Seminar No. I



The first Departmental Seminar is held in The Department on dt. 12.09.2017 by
the Topic "Educational Problems & Educational Aspirants of the SC & ST"

The Resource Person was Sri. Sugata Das
Head of the Dept of
Education

② Dr. Sugata Kumar Patra
Head of the Dept of
Education
B.P Women's College Digapahandi

#(four) No. of Paper Presented by the students ⇒ nil

① Miss Nalini Rana, +3 2nd year Arts
② Miss Minakhi Gouda, +3 2nd year Arts
③ Miss Amita Dakua, +3 2nd year Arts
④ Miss Nikita Nayak +3 2nd year Arts

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date 07-09-2017

It is informed to all the Students of +3 1st, 2nd yr, 3rd yr to attend the Department Seminar (Topic - Educational Problems & Educational Aspirants of SC & ST) on 12.09.2017 by 11.00 A.M at room no- 108

Organising Secretary

PRINCIPAL
RAMAJEE DEGREE MAHAVIDYALAYA
BHISMAGIRI (GANJAM)

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF EDUCATION,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC :- "Educational Problems & Educational Aspirates of the SC & ST"

Date :-

1. Lighting the candle by Principal, Guest and respective :-
2. Puspamalya to Lord Jaganath (Santipatho)
3. Chair addressed by
   Prof Kumari Priyadarsani Pradhan Dept of Edn
4. Opening song by : Miss Puja Rana & Miss Nalini Rana
5. Paper presented by the students :
   Miss Nalini Rana,+3 1st yr.Arts
   Miss Minakhi 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 Pattanik Womens College,Digapahandi
8. Speech by President : Prof. Raghunath Nayak,Principal
9. Vote of thanks by : Prof Kumari Priyadarsani Pradhan,
   Lect.in-Eduaction

Prof Kumari Priyadarsani Pradhan
Organising Secretary

Ramesh Kumar Gouda
Lina kumari Sahu
Sonali Patra
MADHU KESWARI
Tikina Peetro
Pabitra Kumara Gouda
Sridhara Gouda
Madhusmi Reddy
Subhashmita Behera
Puja Pradhan
Laxman mahanty
Lokanath Sahu
Sunil kumara Gouda
Sangita rani Rout
Ram Gouda
Sweta Patro
Ramesh Maharana
Dipak kumar Sahu

Educational Problems & Educational Approach
of the [illegible] Indians & Judging

[illegible] literacy is a liability to dominate
[illegible] & [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible]

Education is never having positive place towards
one's health and tried with needs according to
needs. Education is a continuing grace to the young
generation to the old wealth to the poor & unfortunate
& to the rich. Aristotle the Greek philosopher
says that

Education is the Creation of a sound mind
Reside in a sound Body.

According to Gandhi — By Education I mean an all
round drawing out of the best in
child and man body mind & spirit.

Before Independence =>

The Singhs of 17 people were detained
by Britishers they were expelled by petty Contractors
Land Lords money lenders & Contractors

After Independence => Government had made a provision of 1967
Rs 22 Crores in the seventh five year plan for the

Date: 28/09/18

Department of Zoology in Ramnagar Degree Mahavidyalaya organized an departmental seminar on the topic Recombinant DNA Technology

Research person name:-
Dr. K.K.R Patro

Course of Program - Degree Course

Participation - 14 students presented papers

Presented by:
1. Rakesh Maharana
2. Pinky Bisoyi
3. Rishikesh Pradhan
4. S. Pavan Patro

OFFICE OF THE PRINCIPAL, RAMNAGAR DEGREE MAHAVIDYALAYA, RAMNAGAR, CUTTACK (ODISHA)

NOTICE

Date: 28.09.18

It is informed to all the students of B.Sc 1st, 2nd, 3rd yr. that a seminar on the topic Recombinant DNA Technology will be held on 28.09.18 at 10 A.M in the Zoology Department.

Principal
Ramnagar Degree Mahavidyalaya

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF ZOOLOGY,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC : R-DNA TECHNOLOGY Date – 28-09-2018

## INAGURAL SESSION

1. Lighting the candle by Principal, Guest and respective :-
2. Garland to Lord Jaganath (Santipatho)
3. Chair addressed by :
   Prof. Lingaraj Panigrahy,Dept.of Zool.
4. Opening song by : Miss Pravati Panda.
5. Speech by President : Beloved Principal

## SEMINAR SESSION

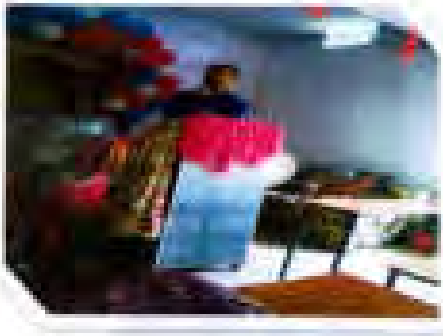
6. Paper presented by the students :
   Mr Akash Maharana
   Miss Pinky Bisoyi
   Miss Ashalata Pradhan
   Mr A Papun Patro
7. Paper presented by the staffs :-
   Prof. Lingaraj Panigrahy, Dept.of Zoology.
8. Seminar Topic By Chief Guest : -
   Dr. K.Krishna Raju Patro, Lect-in-zoology
   (Science college Kukudakhandi,Kukudakhandi)
   Research Person
9. Seminar Topic By Chief Speaker : - Mrs. Arati Patro,
   Khemundi college, Digapahandi

## VALEDICTORY SESSION

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

STUDENT MANAGEMENT

1. Sindhu Nandini Pentapati
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. Kavya Shree
7. [illegible]
8. [illegible]
9. Pavithra Varsha
10. [illegible]
11. [illegible]
12. Shanthi Latha Nagaraj
13. [illegible]
14. [illegible]
15. [illegible]
16. Lithika Kavi
17. Sangeeta Reddy
18. [illegible]
19. [illegible]
20. Sridhar Gowda



DEPARTMENT OF ZOOLOGY: SEMINAR ON :- R DNA TECHNOLOGY DT : 28.09.2018

m-RNA is preferred for the following reasons

m-RNA represents the actual genetic information being expressed.

Selection and isolation of m-RNA are easy.

As introns are removed during processing m-RNA reflects the coding sequence of the gene.

The synthesis of recombinant protein is much easier with m-RNA cloning

**CONJUGATION** process during which two live bacteria come together cytoplasmic bridges and transfer single stranded donor to receipient.

**ELECTROPORATION METHOD** : It is based on the principle that high voltage electric pulses can induce membranes to fuse.
Electric shocks can also induce cellular uptake of exogenous DNA from the suspending solution.

**LIPOSOME MEDIATED GENE TRANSFER**
On treatment of DNA fragment with liposomes, the DNA pieces get encapsulated inside liposomes. These liposomes can adhere to cell membranes and fuse with them. It transfer DNA fragments.

# PROCEDURES

**TRANSFORMATION** : The first step in transformation is to select a piece of DNA to be inserted into a vector.

The second step is to cut that piece of DNA with a restriction enzyme and then ligase the DNA insert into the vector with DNA Ligase.

The insert contains a selectable marker which allows for identification of recombinant molecules. An antibiotic marker is often used so a host cell without a vector dies when exposed to a certain antibiotic, and the host with the vector will live because it is resistant.

The vector is inserted into a host cell, in a process called transformation. One example of a possible host cell is E. Coli. The host cells must be specially prepared to take up the foreign DNA.

Session 2

Name of the Resource person with designation and address

Research Papers used for the Expert Lecture on Restriction Endonuclease

Name(s) of Students presented papers

Presented by - 1. E. Susmita
2. Krushna Pradhan
3. Sushil Choudhury

OFFICE OF THE PRINCIPAL, RAMADEVI DEGREE MAHAVIDYALAYA, BHISMAGIRI, GANJAM, ODISHA

NOTICE

Date: 04-03-19

It is informed to all the students of 1st, 2nd, 3rd yr that the Lecture Topic: Restriction Endonuclease will be held on 06-03-19 at 10 AM in room no 108.

Lecturer's Signature

Principal 04/3/19

# AGENDA

## ORGANISED SEMINAR (DEPT. OF ZOOLOGY) DATE-06-03-2019

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

2.Garland to Lord Jagannatha santipatha

3.Opening song by: Miss E Sasmita and Sasmita Panda

4.Introduction by Chief Guest,Chief Speaker and welcoming adress by Lingaraj Panigrahy. (Dept. of zoology)

5.Speech by President.

### SEMINAR SESSION

6.Paper Presented by Students

Miss E.Sasmita

Mr. Krushna Pradhan

Mr Sushil Choudhury

7. Paper Presented by Staff Member:

Sri Lingaraj Panigrahy, Lect-in-Zoology

8.Seminar Topic by Resource Person: Dr. K.K.R Patro

9.Seminar Topic by Chief Guest: Dr Pradipta Sadangi

10.Seminar Topic by Chief Speaker: Sri Deepak Kumar

### VELEDICTORY SESSION

11.Vote of Thanks by: Sri Lingaraj Panigrahy, Lect-in-Zoology

# Student Attendance

1. Sangram Reddy
2. Krishna Chaitanya
3. Akasha Bury
4. [illegible]
5. Krishna Sahu
6. Prakash [illegible]
7. [illegible]
8. Sandeep Nayak
9. Mahesh Kumar Sahu
10. A. Praveen Patra
11. Pinki Bisoyi
12. Reddy Rajkumari
13. [illegible]
14. Pramod Reddy
15. Akash Mahakud
16. Sipra Mohanta
17. S. Sunita Reddy
18. [illegible]
19. Binod Gouda
20. S. Rajeswari Reddy
21. Sasmita panda
22. Sunil Patro
23. E. Sasmita

Inauguration of Seminar

# Restriction Endonucleases

## Contents



## Introduction

Restriction endonucleases are enzymes that cleave the sugar-phosphate backbone of DNA strands. The vast majority of these enzymes have been isolated from bacteria where they carry out a host defense function for the cell. These enzymes recognize a specific DNA base sequence and cleave both strands of a double-stranded DNA molecule at or near the recognition site. All restriction enzymes fall into one of three classes, based upon their molecular structure and need for specific co-factors. Class I endonucleases have a molecular weight around 300,000 Daltons, are composed of non-identical subunits, and require $Mg^{2+}$, ATP (adenosine triphosphate), and SAM (S-adenosyl methionine) as cofactors for activity. Class II enzymes are much smaller, with molecular weights in the range of 20,000 to 100,000 Daltons. They have identical subunits and require only $Mg^{2+}$ as a cofactor [1]. The Class III enzyme is a large molecule with a molecular weight of around 200,000 Daltons, composed of non-identical subunits. These enzymes differ from enzymes of the other two classes in that they require both $Mg^{2+}$ and ATP but not SAM as co-factors. Class II endonucleases are the rarest of the three types.

## The Discovery of Restriction Endonucleases

Prior to 1968 the existence of restriction enzymes was unknown. However, the phenomenon of restriction was well known. Restriction was the term given to the ability of bacteria to recognize and attack any foreign DNA source whether it came from a virus or from another strain of bacteria. In 1968 Matthew Meselson and Robert Yuan reported that they had identified an enzyme in the bacterium *Escherichia coli* strain K 12, that appeared to be able to recognize and digest foreign DNA [2]. This enzyme, they concluded, would be the agent responsible for restriction. They coined the term **restriction endonuclease** to refer to this enzyme. They further demonstrated that each

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enzymes would be ubiquitous among bacteria and that they would [illegible] any double-stranded DNA that was not protected by a specific pattern of [illegible] methylation [7]. Methylation of DNA involves adding a methyl-group (-$CH_3$) to the [illegible] base such that the restriction enzyme will not recognize it. The process of methylation has been shown to be carried out by DNA sequence-specific methyltransferase enzymes [8, 9]. In plants and animals the primary methylated base is 5-methylcytosine (m5C) while in bacteria the major methylated base is $N^6$-methyladenine (m6A) but 5-methylcytosine (m5C) is also found. Examples of these methylated DNA bases are shown in Figure 1. The restriction endonucleases found by Meselson and Yuan in *E. coli* required the presence of $Mg^{2+}$, SAM, and ATP for it to carry out its function. Thus, the first restriction enzyme to be identified was a Class I enzyme.

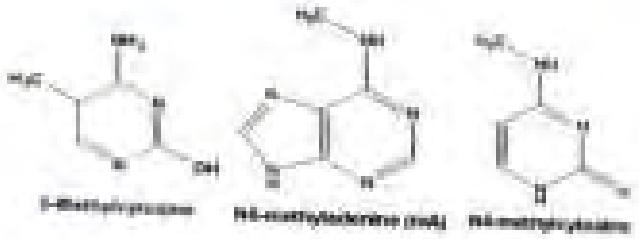


**Figure 1. Structures of the three primary methylated DNA bases in prokaryotes and eukaryotes.**

The report by Meselson and Yuan was quickly followed by two papers describing a similar enzyme in the bacterium *Haemophilus influenzae*, strain Rd [5, 6]. Like the *E. coli* enzyme, the *H. influenzae* endonuclease was inactive in the presence of native DNA but did recognize and digest foreign DNAs. Unlike the *E. coli* enzyme, however, the *H. influenzae* endonuclease only required the presence of $Mg^{2+}$ for activity. The cleavage pattern of both enzymes was limited and consistently reproducible, suggesting that there was a specific DNA sequence that was recognized by the enzymes and that the enzyme would bind to this sequence prior to cleavage [6]. In the companion paper, Kelly and Smith offered evidence that the recognition site of their enzyme was a run of six specific nucleotides in the form,

5′ ... G T Py | Pu A C ... 3′
3′ ... C A Pu | Py T G ... 5′

where Py refers to either pyrimidine (T or C), Pu refers to either purine (A or G), and the vertical line indicates the cleavage site of the enzyme. Note that the symmetry of this recognition sequence is in the form of a **palindrome**, a nucleotide sequence in which the 5′ to 3′ sequence of one strand of a segment of DNA is the same as that of its complementary strand. This feature did not escape notice. "It is unlikely that the symmetry of this sequence is fortuitous, since the number of possible asymmetric sequences of this type

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about 10 times the number of possible symmetric sequences [1]. Thus, any enzyme that recognizes a symmetric sequence has a basic feature of the action of the enzyme.

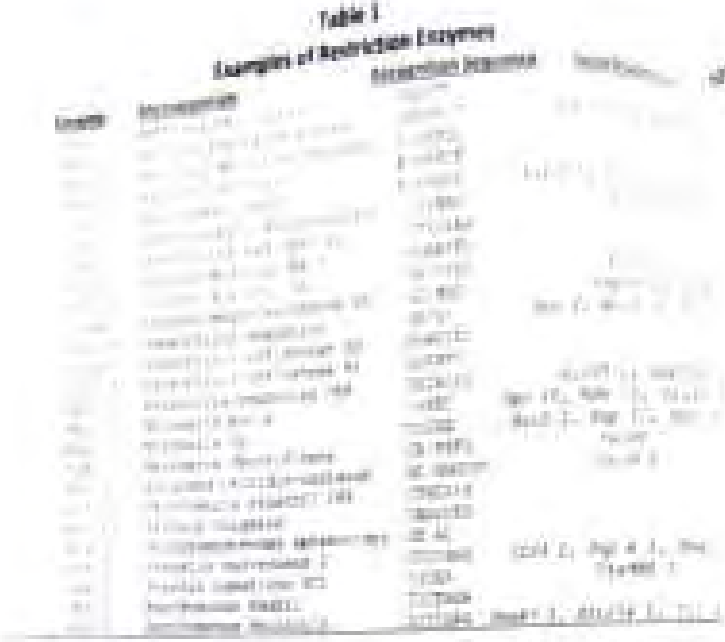
## Properties of Restriction Enzymes

Within a few years the basic outlines of restriction endonuclease action were established. The seminal papers of Linn and Arber [2] opened the floodgates on isolation and identification of restriction enzymes in bacteria. In 1970, Nathans and Smith were able to review the state of knowledge and present a consistent, standard nomenclature for the rapidly growing numbers of known enzymes. The name given to each new enzyme would convey both the genus and the species of the bacterium from which it was isolated, the strain number, and the order in series in which the enzyme was found. Thus, the restriction enzyme designated Hae III was the first enzyme found in the bacterium *Haemophilus aegyptius*, strain III while the restriction enzyme Hpa II was the third enzyme found in *Haemophilus aegyptius*. A list of some of the thousands of currently known restriction endonucleases is presented in Table 1. As the list of restriction enzymes grew and their recognition sequences were identified, it was found in some cases that more than one enzyme could recognize the same sequence. RJ. Roberts conferred the term **isoschizomer** (same cutter) on restriction enzymes that recognized the same DNA sequence [1].

The search for new and unusual restriction enzymes continued apace so that, by 1982, a list of 357 identified restriction enzymes recognizing 90 different DNA sequences was published [7]. Most restriction enzyme recognition sequences are from four to eight bases long and most are palindromic (Table 1). Additional diversity was found among the isoschizomers. For example, the enzymes Sma I and Xma I both recognize the six base sequence CCCGGG but give different fragments with the former cutting CCC|GGG and the latter cutting C|CCGGG. Similarly, the isoschizomeric pair Nla I and Nla III both recognize the sequence CATG but the former cuts CATG|C and the latter C|CATG. Further differences were found in relation to sensitivity to methylation. Both Mbo I and Sau 3A cut GA|TC but when the sequence is methylated as GA*TC, Mbo I fails to cut while Sau 3A is not affected. Conversely, in the case GATC*, the situation is reversed. This phenomenon was put to good use in the case of the restriction enzyme pair Hpa II and Msp I. Both enzymes recognize the sequence CCGG but when methylated as CC*GG Mbo I cuts the sequence and Hpa II does not. This pair of enzymes has proved to be extremely useful in identification of the so-called cpG "islands" that lie near protein coding genes [8, 9].

**Table 1**

**Examples of Restriction Enzymes**



As can be seen in Table 1, most restriction enzymes recognize CG-rich DNA sequences but some AT-only recognition sequences are known. The enzymes *Dra* I (TTTAAA), *Sty* I (AATATT), and *Pac* I (TTAATTAA) are but three of these "AT-cutters." Further, most restriction enzymes will cleave the DNA inside the recognition site but there are seven that do not. The enzyme *Mlu* I recognizes the non-palindromic sequence CCTC but cleaves the DNA seven bases downstream (i.e., CCTC 7/7). Other examples include *Bbv* I (GCAGC 8/12) and *Hga* I (GACGC 5/10). Another variation on the basic theme of restriction enzyme recognition sites are the so-called "degenerate" sequences. The enzyme *Acc* I recognizes the sequences GTATAC and GTCGAC. This can also be written as GTMRAC, referring to the standard nomenclature for degenerate sites (see Supplemental Materials). The five-base cutter *Hin*1 I recognizes four different sequences denoted GANTC (again, see Supplemental Materials). This last form of recognition sequence degeneracy can lead to cases very long recognition sites. The enzyme *Hgi* EII, for example, recognizes the sequence ACCN$_{4}$GGT and the enzyme *Rsa* I recognizes the sequence GTAN$_{1}$TAC. Perhaps one of the longest recognition and activity sequences belongs to the enzyme *Bpi* I with (8/13)GAAGAC(12/8) which is an eleven base recognition site plus cleavage sites a further 8 bases upstream and 13 bases downstream. Finally, the term **non-palindromic** was noted above. There are a number of enzymes that recognize DNA sequences of various lengths that do not form palindromes. Among these are *Asn*I (GAC|CTGC), *Bst*M9 (ACCTGC (4/8)), *Fok* I (GGATG (9/13)), and *Mbo* II (GAAGA (8/7)).

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OFFICE OF THE PRINCIPAL: RAIMAGE DEGREE MAHAVIDYALA: BHIMAGIRI: CACHAR: DIST

Date _____

N O T I C E

It is informed to all the Students of 1st 2nd 3rd yr ... in general the Department Statistics Honours / Physics / Statistics

16.09.2017 FN 10:30 AM/PM in the room no 105

Executive Secretary

Principal
RAIMAGE DEGREE MAHAVIDYALA
BHIMAGIRI: CACHAR

# DEPARTMENT SEMINAR

ORGANISED BY : DEPARTMENT OF ZOOLOGY,
Ramajee Degree Mahavidyalaya,Bhismagiri
Date – 26-09-2019

TOPIC : SERICULTURE

## INAGURAL SESSION

1. Lighting the candle by Principal, Guest and respective :-
2. Garland to Lord Jagannath (Santipatho)
3. Chair addressed by
Prof. Lingaraj Panigrahy,Dept.of Zool
4. Opening song by : Miss Prabhati Panda.
5. Speech by President : Beloved Principal

## SEMINAR SESSION

6. Paper presented by the students :
Mr Krushna Sahu
Miss Shantilata Nayak
Mr S Srikant
Mr Kuna Sahu
7. Paper presented by the staffs :-
Prof. Lingaraj Panigrahy, Dept.of Zoology.

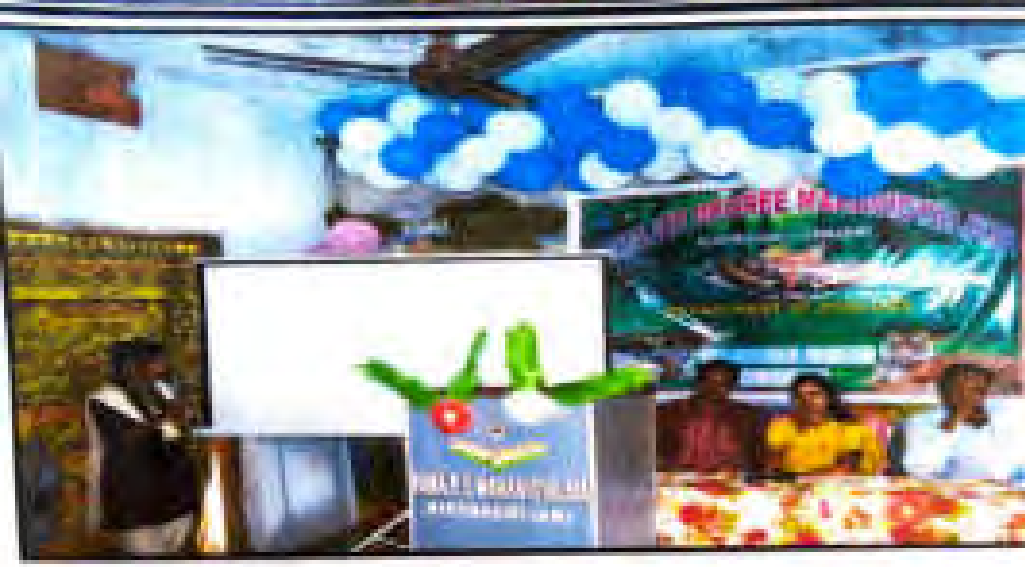
8. Seminar Topic By Chief Guest : -
Dr. Usha Rani Bramha, Lect-in-zoology
(Rama Narayan Science college, Gopalpur)
Research Person

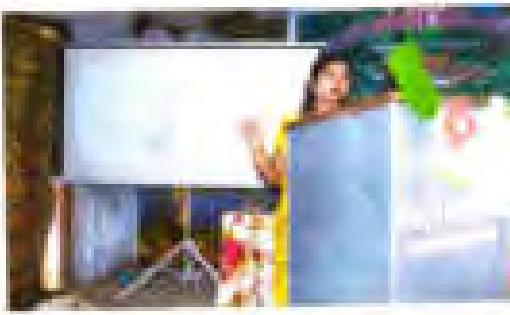
## VALEDICTORY SESSION

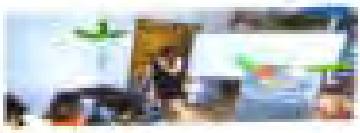
9. Vote of thanks by : Prof. Lingaraj Panigrahy, Dept.of Zool.

Student Attendance

1. Jasmine Panda
2. Lucy Soren
3. Smita Devi Tudu
4. Sangeeta Hembram
5. Lucky Kisku
6. Sanjit Hembram
7. Jasmida panda
8. Sasmita
9. Sunil Prince
10. Abhinash Kanta
11. B. Rajkumari Hatibo
12. Sushil Kr Chaudhary
13. Rahul Kr Sahu
14. Sagarmoni Baruah
15. Bikash Gorain
16. Priyanshu Sahu
17. Arjun Hembrom
18. Sipra Mahalkana







DEPARTMENT OF ZOOLOGY: SEMINAR ON- "SERICULTURE" DT.26.09.2019

OFFICE OF THE PRINCIPAL: RAMAJEE DEGREE MAHAVIDYALA, BHIMAGIRI, GANJAM, DIST.

Date _____

NOTICE

It is informed to all the Students of B.Sc. 1st yr, 2nd yr, 3rd yr to attend the Previous Seminar (Topic – Gene Therapy) on 25-12-2021 by 11:00 AM at room no- 104.

Principal

Programme Secretary

# DEPARTMENT SEMINAR

ORGANISED BY :- DEPARTMENT OF ZOOLOGY,
Ramajee Degree Mahavidyalaya,Bhismagiri

TOPIC : GENE THERAPY Date – 15-12-2021

## INAGURAL SESSION

1. Lighting the candle by Principal, Guest and respective :-
2. Garland to Lord Jaganath (Santipatho)
3. Chair addressed by :
   Prof. Lingaraj Panigrahy,Dept.of Zool.
4. Opening song by : Miss B. Puja Rani Patro
5. Speech by President : Beloved Principal

## SEMINAR SESSION

6. Paper presented by the students :
   Mr Sagar Pradhan.
   Miss Hasina Panda.
   Miss Lucky Kar.
   Mr N. Ramakrushna Reddy.
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. Arati Patro,
   Khemundi college, Digapahandi

## VALEDICTORY SESSION

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

Mani Reddy

DEPARTMENT OF ZOOLOGY: SEMINAR ON :- GENE THERAPY DT : 15.12.2021

Seminar - No-1

01

Dt - 21/12/16

The first department seminar is held in the department on off- on topic - "Green Chemistry"

The resource person were

1. Prof. Prafulla Ku Panda
Dept of Chemistry

2. Sri Himanshu Sekhar Mishra
Dept of Chemistry.

02 (two) nos of paper presented by the students were.

1. Manoj Ku. Gouda (+3 2nd yr sc.)
2. Chandra Sekhar Das (+3 1st yr sc.)

introduction and application of Green Chemistry.

Notice -

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 20-12-16

It is informed to all the Students of +3 Chemistry department to attend the Department seminar. Topic - Green Chemistry on 21/12/16 by 10 AM at room no-

Sharapani Biswasroy
Organizing Secretary

Principal
20/12/16

# 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 Load Jaganath (Santipatho)
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 Sheet 03

1 [illegible]
2 Chandra Sekhar Das
3 Sagar Dansena
4 Mamata Mishra
5 Kanika Dixit
6 B. Chandan Patra
7 Ranjan Ku. Sahu
8 Kasmita Panda
9 Jiten Ku. Dalua
10 Jagyasini Sethy
11 Pratush Panda
12 Sanumkha Patra
13 Prabhu Prasad Bisoyi
14 Bandana Panda
15 Satish Kumar Rabha
16 Laxman Rabha
17 Bipin Bisoyi
18 A. Ramachandra
19 Chandra Sekhar Das
20 Prachira Rana
21 Mitu Gouda
22 Debiprasad Khadanga
23 Dibyan Patra
24 Kaya Jeevan Reddy.
25 Basudev Mallick
26 Ambanagani Gradhan
27 Manoranjan Mishra
28 Meena Sethi
29 Gopal Ch. Shunya Sahu
30 Laxman Raita
31. Barsha Rani Bisoyi

Sangeeta Ambwani
Vet. In Charge

Paper presented by Amit Sanders

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

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

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

4) Chemical products should be designed to preserve efficiency of function while reducing toxicity.

5) The use of solvents should be safer.

6) Synthetic methods should be conducted at ambient 'T' and 'P'.

7) A raw material should be renewable.

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

9) The catalytic reagents are superior to stoichiometric reagents.

10) Chemical products should be designed so that at the end of their function they do not 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 to the 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 applications

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

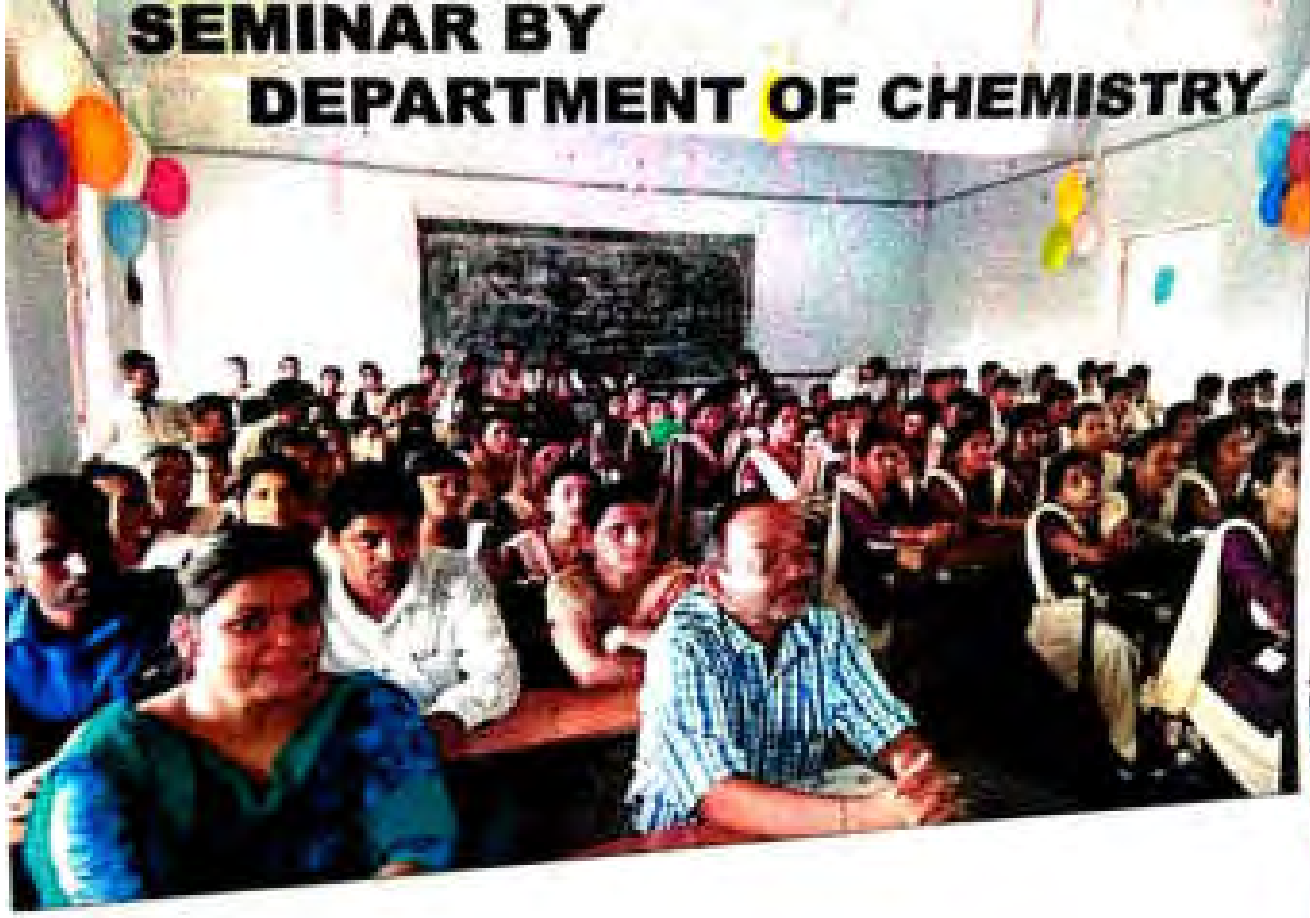
the concept of green chemistry was formally established at the environmental protection agency 15 years ago in response to the pollution prevention act of 1990

Paul T Anastas for the first time in 1991 coined the term Green Chemistry Paul T. Anastas and John C. Warner developed 12 principle 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) design 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-2. Dt. 22-12-17

The second department seminar was held in the department on dt- on topic- "organic chemistry and it's applications"

The resource person was -:

1. prof. Prafulla Ku Kanta

02(two) Nos of papers presented by students.

1. Ramisa Panda (+3 IInd yr sc.)
2. Sagar Dakua (+3 IInd yr. sc.)

Notice -:

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 21-12-17

It is informed to all the Students of +3 chemistry department to attend the Department Seminar (Topic - organic chemistry and its app.) on 22/12/2017 by 10 AM at room no-

Narayan Chinnegouda
Organizing Secretary

21.12.17

# 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 Load Jaganath (Santipatho)
3. Opening song by : Miss Sagarika Pradhan & Miss Tanisa Boxi .
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 09

1 Manisha Naik
2 Liza Rauta
3 Mitu Gauda
4 Himanshu Panda
5 Mamata Mishra
6 Gopal Krushna Sah
7 Bikram Parichi
8 Bibhuja Subasini Sahoo
9 Balaram Parichi
10 Baidal Sahoo
11 Babu Murmu
12 Kabita Dixit
13 Basudeb Mallik
14 Rama Ch. Nishank
15 B. Chandra Patra
16 Prabhu Prasad Behera
17 Ardhendumani Pradhan
18 Raja Jeevan Reddy
19 Sarini Gauda
20 Sagar Bakua
21 Arpita Nayak
22 Manoj Kr. Nanda
23 Chandra Sekhar Das
24 Sibani Gauda
26 A Ramachandra
26 Satish Kumar Patra
27 Bandana Kr. Panda
28 Laxman Rauta
29 Dipti prasad Mahalanya
30 Mina Sethi
31 Sagarika Pradhan

Durga Murmu
Ref-in Chemistry

Talk presented by staff members II

# organic Chemistry and its application

organic Chemistry is the study of compounds that contain Carbon. It is the major branches of Chemistry. It includes a very no. of compounds connected to life or to living processes 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 an important role in the part of development of common household Chemicals, foods, plastics, drugs, fuels etc.

Among the numerous types of organic compou four major categories are found in all living thi Carbohydrates, lipids, protein and nucleic ac antibiotics. Aspirin, vanilla flavouring and hexol- drugs are examples of substances that scien have to be obtained directly from nature, they are manufactured in lab from organic starting materials.

Ethylene is the gas that ripens fruit and a ripe fruit emits the gas which will act on unrip fruit. Thus a ripe tomato placed in a sealed bag with green tomatoes will help ripen the

Petroleum is a mixture of alkanes, cycloalkanes, aromatic hydrocarbons.

Starch is a storage carbohydrate used by plants when plants photosynthesize the used of the energy from sunlight to convert $CO_2$ and $H_2O$ into sugar and $O_2$.

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

Human take in aminoacids and utilize them to synthesize the polymers which are called proteins.

(i) It is used in the producing of soaps, Shampoos, powders, and perfumes.

(ii) Various fuels like Natural gas, petrol are also organic compounds.

(iii) the fabrics that we use 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 - 01 Dt - 27/01/17

The first Departmental Seminar organised by Department of Botany on 27/01/17 by 1st Hour Room No- 107 Topic- Microbes used as Biofertilizer

Resource person name: Dr Sudeshna Chowdhury
Chief Speaker name: Sri Gopinath Dash

Three (03) nos of Students presented paper presented by:

1. Miss Sonika Mishra IIIrd Sc. Microbes in Soil.
2. Mr Debendra Dalai IIIrd Sc Use of Microbes in Agriculture
3. Mr Baleram Panigrahy IIIrd Sc Nitrogen in Soil

NOTICE:

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BIRSMAGIRI; GANJAM; DIST
NOTICE Date- 24/1/17.

It is informed to all the Students of +3 1st 2nd 3rd Part Hons. to attend the Departmental Seminar Topic- Microbes use as Biofertilizer on 27/01/17 by 1st hour at Room no- 107.

Prasanta Kumar Pande
Departmental Secretary

Principal 24/1/17

# AGENDA

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

### INAGURAL SESSION

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

2.Garland to Lord Jagannath(santipatho)

3.Opening song by: Miss Sonika Mishra and Runu dala Behera

4.Indtroduction Chief Guest,Chief Speaker,and welcoming adress by Prasanta kumar Panda, Dept.Botany

5.Speech by President.

### SEMINAR SESSION

6.Paper presented by students:

Miss Sonika Mishra

Mr Debendra Dalai

Mr Balaram Panigrahy

7.Paper Presented by staff members:

Sri Sudhir ranjan Hotta

Sri Prasanta kumar Panda

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

9.Seminar Topic by Speech Speaker: Sri Gopinath Mishra

### VALEDICTORY SESSION

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

# Student Attendance Sheet

1. Sanjita Mishra
2. Sibani Panda
3. Krushna Pradhana
4. Balaram Panigrahi
5. Debendra Dalai
6. Ramkrushna Swani
7. Pritymaya dasia
8. Rabindra Mandal
9. Sibananda Panigrahy
10. Nagaswari Kanyani
11. Rita mani Chaudhuri
12. Ranjan mandal
13. Ashok Pradhan
14. Sudanshu Nayak
15. M. Kishore
16. Sibani Sahu
17. Prapti Rani Panda
18. Padmishree
19. Srikant gauda
20. L. Prasanta Archari
21. Sufiada Padhi
22. Suchismita gauda

Photo Copy Seminar

# Microbes used as Biofertilizer

→ A biofertilizer is a substance which contain 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 bio-fertilizer?

→ 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 fern 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 crop plants through forming nodules on their roots.
→ The non-symbiotic bacteria do not form any association but live freely and fix atmospheric nitrogen.

Symbiotic nitrogen fixers

→ Most important symbiotic nitrogen fixers is Rhizobium and Azospirillum

Rhizobium

→ Rhizobium lives on the root hairs of the legumes by forming nodules.
→ Plant root supply essential minerals and newly synthesized substance to the bacteria.
→ The name Rhizobium was established by Frank in 1889
→ Rhizobium can fix 80-300 kg/ha

Azospirillum

→ It mainly present on cereal plants.
→ Inhabit both root cells, cavities surrounding of roots.
→ Forming symbiotic relation and increasing nitrogen fixing potential of the cereal plant.
→ Azospirillum is recognized as a dominant soil microbes.
→ Nitrogen in the range of 20-40 kg/ha in the rhizosphere of 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 biofertilizers

Azotobacter

→ It is a heterotrophic free living nitrogen fixing bacteria.

-Anabena Azolla.

→ On addition to nitrogen the decomposed Azolla also provides Phosphate, Zinc, Phosphorous to the crop.
→ Increase of crop yield upto 15-20%.
→ Hybrids are growing faster, resistant to heat and low

Advantage of biofertilizer

→ Renewable source of nutrients.
→ Sustain Soil health, supplement chemical fertilizers
→ Replace 25-30% chemical fertilizers.
→ Increase the grain by 10-40%.
→ 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.
→ Stimulates plant growth by secreting growth hormones.
→ Secrete fungicide and antibodies like substances
→ Solubilize and mobilize nutrients.
→ Eco-friendly, non-pollutants, cost effective method

Disadvantage

→ Biofertilizer require special care for long term storage because they are alive.
→ must be used before their expiry date
→ Other microorganisms contaminate the carrier medium, or storage use wrong strain.
→ Biofertilizers lose their effectiveness if the Soil is too hot or dry.

Sources - Books, Internet.

Prasanta Kumar Panda
Lect-in Botany.

→ Azotobacter is the most commonly occurring species in arable soils of India.
→ Azotobacter possessing synthesize growth promoting substances such as auxins, and gibberellins and vitamins
→ Many strains of Azotobacter exhibit fungicidal properties against certain species of Fungus.
→ It improves seed germination and plant growth.

Algae as a biofertilizer

→ Another group of free living nitrogen fixers are cyanobacteria.
→ Commonly called as Blue green algae
→ More than 1/2 species of BGA can fix nitrogen.
→ Nitrogen fixation takes place in specialized cells called heterocyst.
→ BGA very common in rice field.
→ They can easy to produce.
→ Usually they are mass produced in cement tanks filled with fresh water
→ Not require processing, quite and cheap.
→ Cost 10 kg may be Rs. 30-40 only
→ Beneficial in certain crops like vegetables, cotton, sugarcane etc.
→ Some of algal biofertilizers are - Nostoc, Anabena oscillatoria.

Azolla as a biofertilizer

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

Seminar - 02 26/04/18

On 26/04/18 the Department of Botany organised a Seminar on Conservation of Biodiversity Room No. 108

Resource person was
Miss Paiyeswarjani Maharanga
Chief Speaker - Sri Satyadeb Dash

Three no. of Student presented paper

01. Mr. A. Ashok Kumar Pradhan 2nd Yr
02. Miss Sanjeeda Padhy +2 2nd Yr
Endemic conservation
Endemic Species
03. Miss Sibani Sahu
Hotspot of India and World

DEPARTMENT OF THE PRINCIPAL, RANGAILI DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE Date: 20/4/18

It is informed to all the Students of +3 1st 2nd 3rd Bot. Hons to attend the Department Seminar Topic Conservation of Biodiversity on 24/04/18 in 10.30 AM in room no 108

Arunodaya Kumar Panda
Organising Secretary

Principal 20/4/18

# AGENDA

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

### INAGURAL SESSION

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

2.Garland to Lord Jagannath(santipatho)

3.Opening song by: Miss Sibani Sahu and Sripada Padhy

4.Indtroduction Chief Guest,Chief Speaker,and welcoming adress by Prasanta kumar Panda, Dept.Botany

5.Speech by President.

### SEMINAR SESSION

6.Paper presented by students:

Mr A. Ashok kumar Pradhan

Miss Sripada Padhy

Miss Sibani Sahu

7.Paper Presented by staff members:

Sri Sudhir ranjan Hotta

Sri Prasanta kumar Panda

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

9.Seminar Topic by Speech Speaker: Sri Gopinath Mishra

### VALEDICTORY SESSION

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

# Student Attendance Sheet

1. Sthani Panda
2. Priyanka Dukua
3. Krushna Pradhan
4. Rabindra Mandal
5. Debendra Dalai
6. Balaram Panigrahi
7. Ram Mandala
8. Ashok pradhan
9. Archana Pradhan
10. Alekha Maharana
11. Sudeep Pradhan
12. Suraj Bishoyi
13. Prasanta Acharee
14. Ananta Panda
15. Anuradha Nayak
16. Priyanka Sahu
17. Sarfaraj Sahu
18. Succhismita Gouda
19. Sonika Mishra
20. Debasmita Besaye
21. Payal Panda
22. Sudhanshu Nayak


Botany & 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 ecosystem and ecological complex
→ Biodiversity as the totality of genes, species and ecosystem 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 generally a much more useful value than species richness
Genetic diversity
→ It is a level of biodiversity that refers to the total

number of genetic characteristic in the genetic makeup of a species.

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

Values of biodiversity

Food

→ About 80,000 edible plants and about 90% of present day food crops have been domesticated from wild.

→ Drugs and medicines

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

Fuels

→ Forests have been used since ages for fuel wood.

→ 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

- 27. protected habitats are

(1) In-Situ Conservation
(2) Ex-Situ Conservation

In-Situ Conservation :

- It simply means Conservation of species on its natural ecosystems or even on manmade ecosystem
- this strategy emphasizes protection of total ecosystem through network of protected area.
- Protected area's an area of land or specially dedicated to the protection and maintaince these include Biosphere reserves, national park, wildlife, Sanctuaries etc.
- At present we have 11 major biosphere reserves 80 national parks, 420 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 maintaince and breeding of endangered plant and animal species under partially or wholly Controlled Conditions. e.g.-
- Ex-Zoo, Botanical gardens, Aquaria, DNA-bank, Seed bank, gene bank etc.
- there are more than 1500 botanical gardens in the world Contains 80,000 species.
- there are more than 800 Zoos around the world with about 2,000 species of mammals birds, reptiles and amphibians.

→ In India we have many gene bank like -
→ National facility for plant tissue culture Respository.
→ NFPTCR and NBPGR Campus New Delhi.
→ National Bureau of plant genetic research
→ It has been setup for the development of a facility of Conservation of Varieties of crop plants / trees by tissue culture.

Sources - Books, internet

Prasanta Kumar Panda
Lect-in Botany.

Seminar - 02 07.12.2019

Department of Botany of Ramajas Degree mahavidyalaya organized a Seminar on 07-12-19 topic - Golden Rice Room no - 107 at 12.20 AM

Resource person was Dr. N.R. Mahapatra, chief speaker was Sri Pantha Baidya

Three no. of Students presented paper.

Paper presented by (1) Mr. Nanda Panda
(2) Miss Paijyanka Sahu
(3) Miss Anuradha Gouda

Children.

Student Attendance Sheet

1. Sibani sahu
2. Pappu Jani
3. Sudhansu nayak
4. Sangeeta Gauda
5. Payal Gouda
6. Sofiada Padhi
7. Anita mahankuda
8. M. Eshwar
9. Madhusmita sahu
10.
11. Debasish Biswi
12. Basudev Pradhan
13. Priyanka Sahu
14. Prabhasini Panda
15. Priyanka Biswi
16. Rukmini Sahu
17.
18. Alok Mohanty
19. Prabhakar reddy
20. Sonali Patra
21. Sananda Sethy
22. Sushasmita Jena

Children.

# Golden rice

- Golden rice is a variety of oryza sativa rice produced from genetic engineering
- Main purpose is to provide Vitamin A
- Rice provides as much as 15 percent or more of the daily calorie intake of 2 billion people which is half of the World's population.
- Carrots were originally white or purple and the 16th A Dutch horticulturist mutated the carrot to produce carotenes to symbolize the color of Dutch Royal house of orange.
- Who began the Golden rice project?
- Started in 1982 by Ingo Potrykus - Professor emeritus of the institute for plant sciences.
- Golden rice Humanitarian Board responsible for the global development, free distribution of golden rice to target countries.

## Effects of malnutrition

- Symptoms of Vitamin A deficiency (VAD) include night blindness, increased susceptibility to infection and cancer, anemia lack of blood cells (haemolysis) deterioration of the eye tissue, and cardio vascular disease.
- Nearly 9 million children die from malnutrition each year.
- A large proportion of these children die from common illness that could have been avoided through adequate nutrition.
- The reduced immune competence increases the morbidity and mortality rates of children.

How does it 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 catalyzes the conversion of Geranylgeranyl pyrophosphate to Phytoene)
→ 2. Lycopene cyclase (crtI) from Soil bacteria Erwinia uredovora.
→ produces enzymes and catalysis for the biosynthesis of Carotenoids β-Carotene on the endosperm.
→ The psy and crtI genes were transferred onto the rice nuclear genome and placed under the control of an endosperm-specific promoter. So they expressed on the endosperm.
→ The exogenous IPI gene gene has a transit peptide sequence attached to it so it is targetted to the plastid where geranyl geranyl diphosphate forming occurs.
→ The bacterial crtI gene was an important conversion to complete the pathway.
→ Since it can catalyze multiple steps on the synthesis of Carotenoid, while these steps require more than one enzymes in plants.
→ The end product of the engineered pathways is lycopenes, but of 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 common cultivation can be cultivated evenly growing, seeds by farmer saved seeds,
→ therefore no need yearly budgetary investment for distribution.

Disadvantage

→ Health
→ may cause allergies or fail to perform desired effect
→ Supply doesnot provide a substantial quantity as the recommended daily intake.

Environment

→ Loss of biodiversity, may become a pregarious weed and endanger the existance of natural rice plants.
→ Genetic Contamination of natural, global staple foods.

Culture

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

Source - Books, internet

Prasanta Kumar Panda
Lect in Botany.

Dt.

Seminar No - 1

A Seminar on "Sectoral Distribution and Economic Development" organised by Department of Economics on Dt. 08-11-15, Room No - by 12 pm

Name of the Resource Person - Dr. Haraprija Pattanaik
H.O.D of Economics
Khemundi College
Digapahandi (Ga)

Papers presented by - 1. Kshab Gouda
+3 - 1st yr (Arts)
2. Mita Behera
+3 - 1st yr
3. Ramakrushna Pradhan
+3 - 1st yr
4. Jhinmiyan Gomango

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALAY; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 24.10.2013

It is informed to all the Student of +3 [illegible] Department to attend the Department Seminar (Topic- "Sectoral Distribution & Economic [illegible]opment" on 08.11.2013 by 11.30A.M. in room no- 102

Signature Secretary

# 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 Jaganath

3. Opening song by :Koyal Rani Bishoyi

4. Introducation of Chief Guest, Chief Speaker and welcoming address by - SmtNutanDass, Lecturer in Economics

5. Speech by President :Dr.Judhisthir Swain

## SEMINAR SESSION

6. Paper presented by the students :

Mr.KeshabGouda ,+3 1st Year Arts
Mr.RamaKrushnaPradhan , +3 1st Year Arts
Mr.JhirmiyaGamango , ,+3 1st Year Arts
Miss Koyal Rani Bishoyi,+3 1st Year Arts
SmtmitaRehera, +3 1st Year Arts

7.Paper presented by staff Members :-NutanDass
Lecturer in Econ

8.Seminar topic by Chief Guest :-Dr.HarapriyaPattanaik,Reader

9.Seminar topic by Speech Speaker: Dr.Krushna Chandra Pradhan

## VALEDICTORY SESSION

10.Vote of thanks by: SmtNutanDass , Lecturer in Economics

Organizing Secretary

Gayatri Gayada (+3 1st year Arts)
Poorna Krushna Pradhana ( " )
Jhilamiya Gagrango. ( " )
Sudeepta Sahoo ( " )
Mamini Behera
mita Behera
Liza Jani
Gopal Rani Bishoyi
Raja Laxmi Pradhana
Bijaya Mallick
Sitan Pradhan
Maheswar Reddy

# SECTORAL DISTRIBUTION & ECONOMIC GROWTH

## Introduction :-

During the British rule, Indian economy was a feudal economy. Feudalism was characterized by a privileged land-owning class which was created to protect and support the colonial masters. The tillers were not the owners of land. They had to pay heavy rent to the landlords. As a result the poor peasants could not invest anythings on land. The productivity of land was very low. This led to their poverty and poverty of their soil. During the course of Industrial Revolution British industries 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 un-development, various schemes were implemented and Five-year plans for the development of agriculture industry, trade, transport and communication. Neh. the architect of planning India wanted India to be industrially developed. Hence from the Second Five-yea plan, the process of rapid industrialisation was built Till now we have completed 11 Five year plans and t Twelveth Five year plan is now in progress.

Sectors since Kinds of Growth of GDP :-

While estimating the Indian economy in 3 sectors, they are: 1) Primary Sector, 2) Secondary Sector, 3) Trade transport and communication, 4) Banking, insurance and real estates, 5) Community and personal services 6) foreign trade.

When total production in each Sector of the economy is added together, we get gross national product. To calculate GDP, the rest of the world sector (external Sector) is excluded. In the following table, India's rates of growth of GDP by industrial origin since 1950-51 have been presented. To simplify our analysis trade, transport, Communication, banking, insurance community and personal services have been included in the tertiary Sector.

Growth Rate of Primary Sector :-

The Compound annual growth rate of India's GDP at factor cost by industry of origin from 1950-51 to 2003-04. It is seen that agriculture and allied activities indicate a slow rate of growth. This growth rate showed a declining trend till 1980-81 and then rose to 3.6% per annum during 1980-81 and 1990-91. Thus, the average growth rate of agriculture in 5 decades of planning was 2.6%

Classification of Economic

From the view point
economy of any country
into 3 sectors as discussed

1. Primary Sector :-

Primary Sector refers
economy which exploits
produced goods. Agriculture
mining, fishery, forestry
included in this Sector.
workers dominate.

2. Secondary Sector :-

It is also called the
manufacturing Sector which
good into another is called
manufacturing, electricity, gas,
included in this Sector.

3. Tertiary Sector :-

The service Sector of the economy is called
the tertiary Sector. Service of various kinds like
education, health, banking and insurance, trade and
transport are included in the tertiary Sector.
In highly advanced countries, the contribution of
Sector to national income is the

ivities :-

economic activities the
be broadly divided
below.

to that Sector of the
natural resources to
and allied activities like
ginary, poultry etc. are
underdeveloped countries, primary

transforms one physical
Sector. The
water supply etc. are

Growth Rate of Secondary Sector :-

The growth rate of ... sector ... recorded at an average ... annual growth rate of ... percent in the ... decades of planning. But ... the first 16 years ... has been 5.9 and ... of economic reforms, the ... growth rate of ... respectively per annum. ... industrial Sector plays a dominant ... in determining the growth rate of our GDP.

Growth Rate of Service Sector :-

The average growth rate in the Service Sector during 1950-51 and 1990-91 was 4.9% per annum. But during the first ten years of economic reforms, its growth rate increased to 7.5%. From 2004-05 to 2010-11 it rose to 8.2%. The high growth rate of the service sector indicates rapid growth of infrastructure in our country.

Contribution of different Sectors to GDP :-

To study the structural change in any economy we have to analyse the contribution of different producing Sectors to the national output. Over the time, the changes in it show the extent of change in the structure of production.

declining share of agriculture
increasing contribution of industrial sector
increasing contribution of service sector

**Conclusion :-**

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

Seminar - 2 Dt.

A Departmental Seminar on "Gender Inequality and Women Empowerment" organised by Department of Economics on Dt. 06-09-16, Room no. 110 by 11.30 Am.

Name of the Resource Person — 1) Dr. Hanapriya Pattanaik
H.O.D, Economics Dept.
Khorisunda College (Bhubaneswar)
2) Mr. Prabhujeet Panda
Lect. in Economics
Khorisunda College

Paper Presented by — 1. Keshab Gaiada, +3 2nd yr
2. Parikshyshna Pradhan "
3. Jhinmiya Ganango "
4. Kajal Rani Bijoyi "
5. Gyanmi Shankar Sahu, +3 1st yr
6. Chitrasen Mahanty "

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALAYA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date:- 27-10-2016

It is informed to all the student of +3 Economics Honours to attend the Department Seminar (Topic – "Gender Inequality & Woman Empowerment") on 06-09-2016 By 11.30A.M. at room no- 110.

Nutana Ray

# AGENDA

**Departmental Seminar(06-09-2016) organised by Dept of Economics**

## INAUGURAL SESSION

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

2. Garland to Lord Jaganath

3. Opening song by :Koyal Rani Bishoyi

4. Introducation of Chief Guest, Chief Speaker and welcoming address by - SmtNutanDass, Lecturer in Economics

5. Speech by President :Dr.Judhisthir Swain

## SEMINAR SESSION

6. Paper presented by the students :

Mr.KeshabGouda ,+3 2nd Year Arts
Mr.RamaKrushnaPradhan , +3 2nd Year Arts
Mr.JhirmiyaGamango , ,+3 2nd Year Arts
Miss Koyal Rani Bishoyi,+3 2nd Year Arts
Mr.Gouri ShankarSahu(+3 1st year Arts)
Mr.KailashReddy(+3 1st year Arts)
Mr.ChitrasenMohanty(+3 1st year Arts)

7.Paper presented by Staff Members :-NutanDass
Lecturer in Econ

8.Seminar topic by Chief Guest :-Dr.HarapriyaPattanaik,Reader

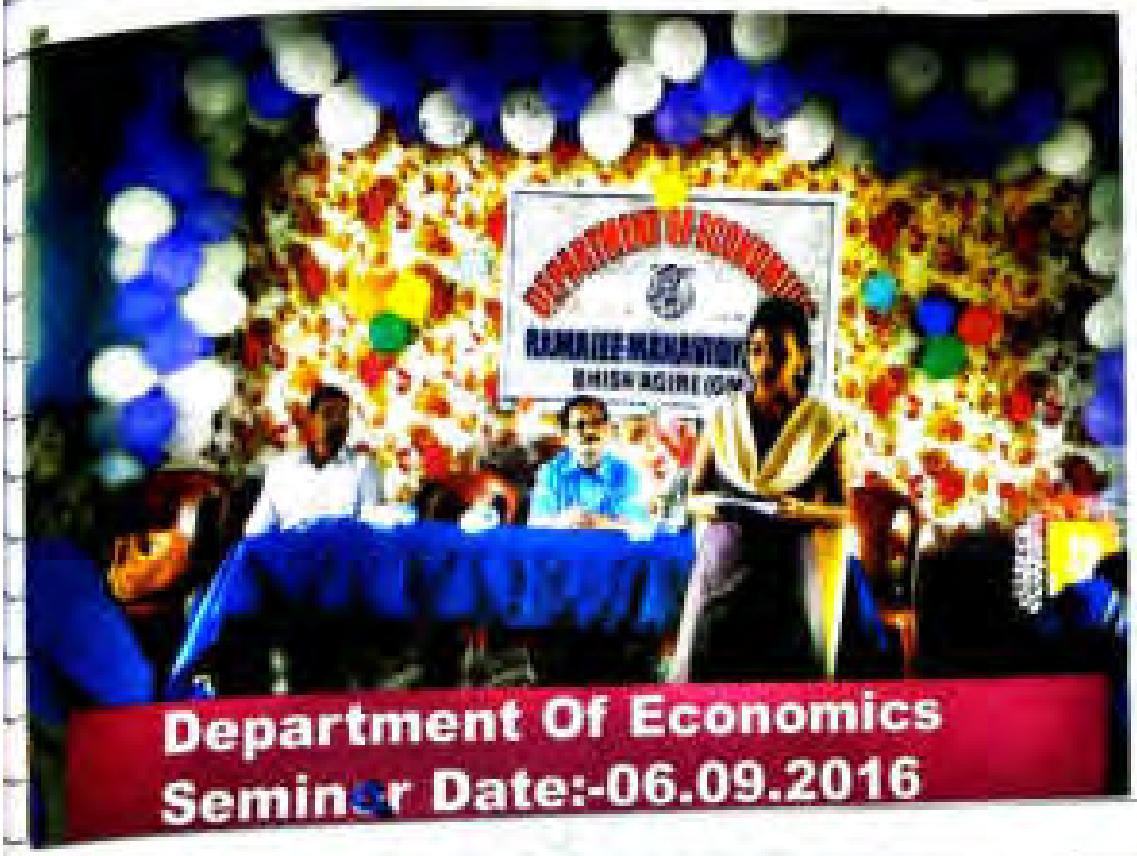
9.Seminar topic by Speech Speaker: Mr.Prabhanjan Panda,Lecturer

## VALEDICTORY SESSION

10.Vote of thanks by: SmtNutanDass , Lecturer in Economics

Organizing Secretary

Photo —


Department Of Economics
Seminar Date:-06.09.2016


Department Of Economics

# GENDER EQUALITY AND WOMEN EMPOWERMENT IN ODISHA

1. 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, responsi-bility 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 un-equal treatment or perception of individuals wholly or partly due to their gender. It arises from differences in gender roles.

## Women Empowerment :-

Empowerment refers to increasing the spiritual, political, social and economic strengths of individuals and communities. It often involves the empowerment developing confidence in their own capacities. It is a 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 circumstances 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 priority 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 is empowering 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 Jan 2015 (to empower the woman through SHG)
2. Mamata Yojana
3. Banasree 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. promotion of women's

Self-help Groups (WSHGs) has therefore been adopted as a key strategy for achieving women's empowerment. For upliftment of WSHGs different schemes like Micro Credit Support, Seed Money, Financial Assistance to BLF and Drudgery Reduction were completed.

Objectives of Mission Shakti :-

A. Formulation, graduation and promotion of Self-Help Groups.
B. Establishment of Bank Linkage of WSHGs.
C. Financial Assistance to WSHGs
D. Imparting Training for Complete Management of WSHGs.
E. Strengthening and Capacity building training to WSHGs.
F. Conducting Exposure visits to ~~both~~ WSHGs.
G. Skill based Training, Market Linkage and Credit linkage based on key activities.
H. Production, Promotion & Marketing of Products of WSHGs.

Empowerment 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 achieving the objectives of rural development programmes. SHGs is a small voluntary association to form a group. It is an informal & homogenous group consisting of not more than twenty members. The number has been limited to 20 for each SHG in order to avoid legal complication 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 homely atmosphere and labour-intensive mode for poverty reduction which simultaneously works to empower & shape the lives of its members in a better way.

Conclusion :-

It is important ~~that~~ to mention that empowerment is a state of being as well as state of mind & before full empowerment can be realized, 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.

Dt. - 24-09-21

Seminar-4

A Departmental Seminar on "Poverty in India" Organised by Department of Economics on Dated 24.09.2021 Room No - 112 by 11.30 A.M.

Name of the Resource Persons :-

1. Shri Jena Mani Sahu
   Lecturer in Economics.

Paper Presented by :- 1. Laxmi Kanta Bhalabhai +3. 3yr Arts
2. Suman Badatiya ,,
3. Chumuki Behera +3. 2nd yr Arts
4. J. Dhamendra ,,

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALAYA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date:- 16-09-2021

It is informed to all the student of +3 Economics Honours to attend the Department Seminar (Topic – "Poverty in India") on 24-09-2021 By 11.30A.M. at room no- 112

Nutana
Organising Secretary

# AGENDA

**Departmental Seminar (24-09-2021) 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 Gust, 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. Laxmikanata Bhalabhai, +3 final Yr
   b. Suman Badatya +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. Voter of thanks by :- Smt Nutana Das Lecturer in Economics

Organizing Secretary

1.) Laxmikanta Bhalabhai
2.) Narayan Badatya
3.) Sandhya Kumari Pradhan.
4.) Epsita Sahu
5.) M. Lipsa Rani Patna
6.) Suman Ku. Badatya
7.) Srimukheeni Bishoyee
8.) Ganesh Gouda
9.) Kedarnath Sahu
10.) Shivaram Jani
11.) Bisakha Mahanana
12.) Pinky Gouda
13.) Laxmi Rani Pradhan
14. Bishnupriya Pradhan +3 2nd year
15. M. Jyoti Achary
16. Monalisa Sahu
17. Chumuki Behera
18.) Asha kumari Gouda
19. Jutu Dharmendra
20. D. Akash Patro
21. Durgaprasad mahiro
22. G. Sangram Patro


DEPARTMENT OF ECONOMICS
RAMJEE DEGREE MAHAVIDYALAYA,BHISMAGIRI (GM)
SEMINAR
TOPIC "POVERTY IN INDIA"
DATE - 24-09-2021

# POVERTY IN INDIA

## Poverty:-

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

poverty is a curse. The greater curse is that it is self-perpetuating in character. Therefore sooner it is eradicated, better 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, medicine for his bare existence, he is treated to be a 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 really means.

Absolute poverty - Absolute poverty is defined as "The inability to obtain the minimum standard of consumption necessary for one's bare existence." Failure to get the minimum consumption requirements 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 falls behind the consumption standard of the other." "It is thus a measure 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. It is so vast and widespread that the study of relative poverty becomes redudant.

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 nutritional level as indicated 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 explosive. When we think of eradication of poverty in India, we ought to find out its causes. It will help us to devise suitable policy measure 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, our rate of economic growth was very slow, i.e. 3.7 per cent per annum. This resulted in higher poverty ratio. If the rate of economic growth is slow. there is nothing to distribute but to distribute. poverty.

2. Rapid growth of population :

Rapid growth of population is major cause of poverty and unemployment in india. Rapid population growth necessitates higher "demographic investment" to maintain the existing level of per capita income. This drains our "economic investment" which raises per capita income. Therefore in any programme of poverty reduction, there is no escape route to 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 (TRYSEM)
5. Jawahar Rozagar Yojana (JRY).
6. Indira Awas yojana.
7. Million wells schemes (MWS)
8. Development of women and children in Rural Areas (DWCRA).
9. Ganga kalyan yojana (GKY).
10. Employment Assurance scheme (EAS).
11. The Swarnjayanti Shahari Rozgar Yojana.
12. prime Minister's Rozgar Yojana (PMRY)
13. Jawahar Gram Samridhi yojana (JGSY).
14. Sampoorna Gramin Rojagar yojana (SGRY).
15. Swarnajayanti Gram Swarozgar Yojana (SGSY).
16. Mahatma Gandhi National Rural Employment Guarantee scheme.

Nutan Das

Seminar - No - 3

Third Seminar of Department of Physics held on the occasion on 15/11/18 Topic: (Superconductivity)

The Resource person were.

1. Sri. Sri. Sri. Sri.
Dept. of Physics

2. Sri. Sri. Sri.
Dept. of Physics

No of Peoples present in the seminar

1. Sri. Sri. Sri. (3rd Year)
2. Sri. Sri. Sri. (3rd Year)
3. Sri. Sri. Sri. (3rd Year)
4. Sri. Sri. Sri. (3rd Year)

NOTICE :-

OFFICE OF THE PRINCIPAL; RAMAJEE DEGREE MAHAVIDYALA; BHISMAGIRI; GANJAM; DIST

NOTICE

Date- 15/11/18

It is informed to all the Students of Physics to attend the Department Seminar (Topic - Superconductivity) on 15/11/18 by 11:30 AM at room no-

Organizing Secretary 15/11/18

Principal 15/11/18
RAMAJEE DEGREE MAHAVIDYALAYA
BHISMAGIRI (GANJAM)

# AGENDA

## ORGANSED SEMINAR (DEPT.OF PHYSICS) Date-18/11/2018

### INAUGURAL SESSION

1. Lighting the candle by Principal,Guest and respective :-
2. Garland to Load Jaganath (Santipatho)
3. Opening song by : Miss Bhabani Maharana & Deepti Ranai Sahu
4. Introducation 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 Manisha Panigrahy,+3 3rd yr.
   Miss Deepti Rani Sahu,+3 2nd yr.
   Miss Liza Rani Patro,+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

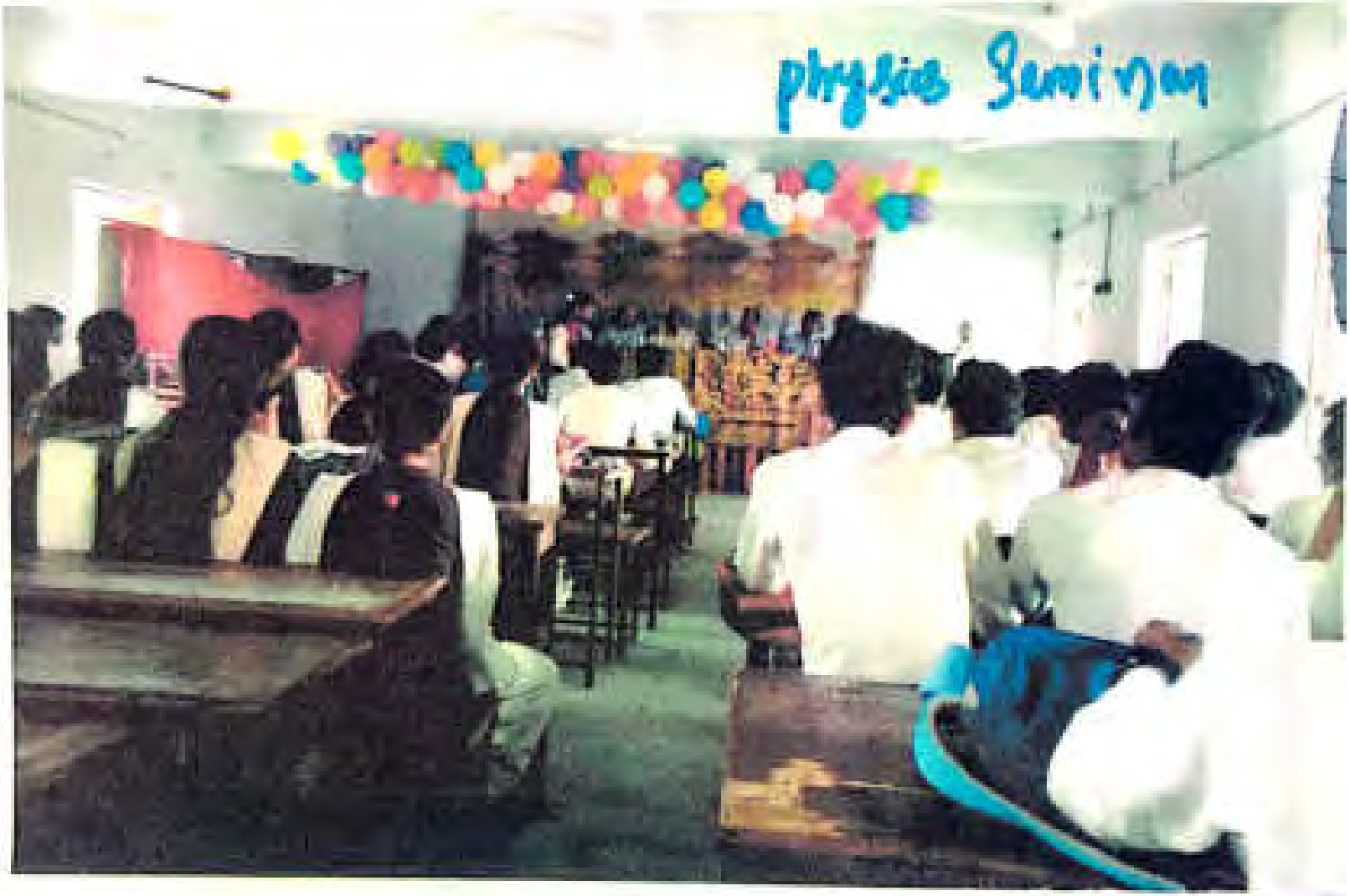
10. Vote of thanks by : Sri Ranjit Kumar Sethi,Dept.Physics

Organizing Secretary

# Student Attendance

1. Bhagaban Pradhan
2. Sagar Pradhan
3. Dilip Pradhan
4. Debasmita Gouda
5. Sibaram Nayak
6. Kishan maharana
7. Sanj Pattanaik
8. Madhu Gouda
9. Raka Sahu
10. Dilip Raha
11. Basanta pradhan
12. Pradeep Kumar Gouda
13. Jyoti Gouda
14. Kuna Raha
15. Rabindra Pradhan
16. Gayatri Jangiety

PHOTO 1



# | Superconductivity |

## Historical Introduction

In 2011, the world celebrated hundred glorious years of the discovery of superconductivity. It was discovered by a Danish Scientist H. Kammel high onnes on 8th April 1911. He found that solid mercury lost its electrical resistance completely at about 4.2 K. Later some other material 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 destory the order, brought about by an attractive interaction between pairs of mediated by Phonons which are the quanta of lattice vibrations in a crystal. Super conductivity 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 ochsenfield in 1933. When a superconducter is cooled from the normal state to the superconducting state in an external magetic field, the magnetic lines of force are rejected out of the material. In other words, the magnetic induction become zero in the superconducting state this is an independent signature of the superconducting state, and does not follow from the resistanceless state from this effect we learn then 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 described how superconductors interact with electro-magnetic field. The other experimental observations pertain to 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 isotopic mass of the atom to the transition temperature. The latter led to the belief that phonons could play a role in the understanding of the mechanism of superconductivity.

Finally, the breakthrough came in 1957. In this year John Bardeen, Leon Cooper and James Schrieffer published their work on the mechanism of superconductivity based on the concept of cooper pair between two electrons of opposite spins and opposite momenta. The pairing creates an energy gap at the Fermi level. The story at once explained all the experimentally observed phenomena. As a result, the three were awarded Nobel Prize in Physics in 1972.

The story is not yet complete. In 1961, a graduate student B. Jan Josephson of the University of Cambridge, UK, published a work on tunneling of cooper pairs from one superconductor to another, 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 gap would be zero, the pair correlation amplitude would not be zero. Thus there is no hindrance for pair tunneling across the insulating barrier. The discovery fetched 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 fullerenses. The latter compounds are solids with alkali atom intercalated carbon-60 molecules. The transition temperatures were not very appreciable in these system.

In 1985 there was a breakthough. Georg Bednorz and Alexander muller 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 unusal ceramic compound. when lanthanum was replaced by Yttrium, the transistion temperature showed up to a staggering 90K. For the first time the transition temperature crossed the liquid nithogen temperature of 77K. Soon several compounds were found in this kind of category and all present the highest transition temperature is recorded at about 135K in $HgBa_2Ca_4Cu_3O_x$. Bednorz and muller were awarded Nobel Prize in Physics in 1987 for their discovery. This is one of the quickest recognitions in this story of Nobel Prizes.

The Russians, who were earlier ignored, were recognized. A.A Abrikosov and Vitally Ginzburg received Nobel Prize in 2003 for their work on Superconductivity. Earlier Lev Landau (1961) and Pyotr Kapitza (1978) were awarded Nobel Prizes for their work in superfluidity and low temperature Physics.

In the meantime superconducity was discovered in $MgB_2$ and Iron based compounds. Despite enormous work, there hasbeen no consensus on a suppersuitable mechanism to explain the occurrence of high Tc Superconductivity. This is still a wide open subject. The search for room temperature Superconducity continues. Then only there could be commencial applications. Room 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 measurments on electrical resistivity. He noticed that the resistivity of mercury dropped down to zero at 4.2K. Repetition of the experiment it yielded

The same results. The phenomenon was named as supha-conductivity. Later he discovered that some other metals also showed the same phenomenon, but at distbetent 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 me 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.

B. 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 above $T_c$, disappear below. In other words, the magnetic induction $\vec{B}$ is zero inside the solid in the superconducting state. This situation is show in Fig 11.1.

Fig 11.1 (a) A superconductor above $T_c$ in the presence of a magnetic field $\vec{H}$. (b) the same material below $T_c$

Below $T_c$, we have $\vec{H} + 4\pi\vec{M} = \vec{B} = 0$. The magnetic susceptibility $= -(M/H)$ it is of the order of $10^{-1}$. For a typical diamagnetic, $\chi$ is of the order of $10^{-6}$. Thus a superconductor behaves like a perfect diamagnetic.

From Ohm's law we have $\rho \vec{J} = \vec{E}$. If $\rho = 0$ and $\vec{J} \neq 0$, then $\vec{E} = 0$. It leads, from maxwell's equation, $\nabla \times \vec{E} = -\frac{1}{c}\frac{\partial \vec{B}}{\partial t}$, to constancy of $\vec{B}$, which violates meissner effect. Thus meissner effect does not follow from ohm's law. In other words, meissner effect is independent of zero resistivity of the superconductor.

C. Type I and Type II superconductors

superconductor which follow the meissner effect completely are type-1 superconductors. Here the magnetization is directly proportional to the magnetic field upto $H_c$, see Fig. 11.3. It 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 its value at $H_c(T) = 0K$. The critical field is plotted as a function of T in Fig 11.2.

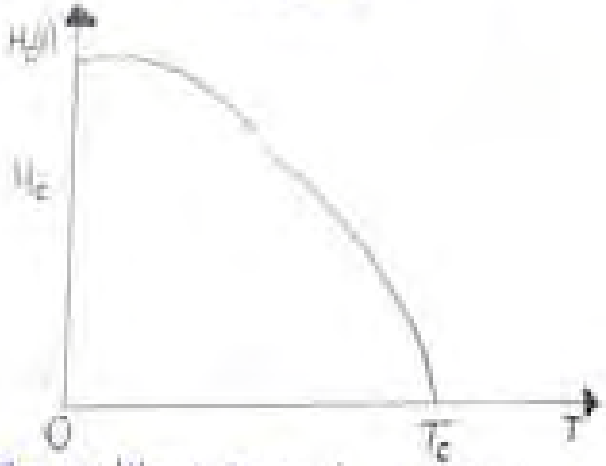



Fig: 11.2: The critical field is ploatted as a function of temperature.

Just as their 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 11.4.

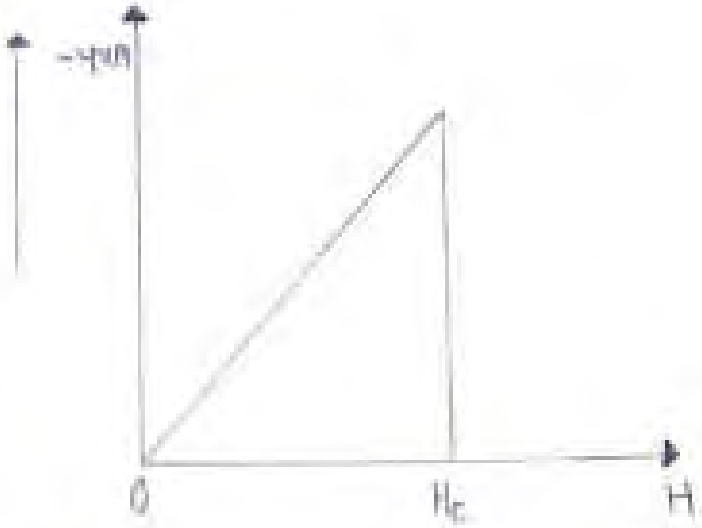



Fig. 11.3: Illustration of meissner effect. The magnetization is proportional to H up to $H_c$. The asymbols S and N represent, respectively, superconducting and normal-conducting states.

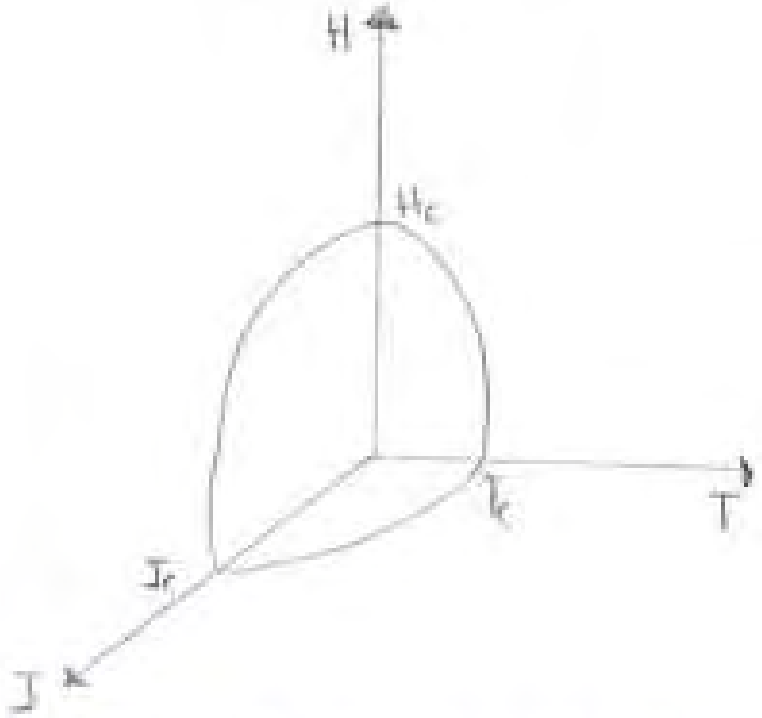



Fig. 11.4: Phase diagram in a space spanned by $T_e$, H and I. Within the closed shape bounded by the parameters $T_c$, $H_c$ & $I_c$, the state is superconducting, and beyond, normal.

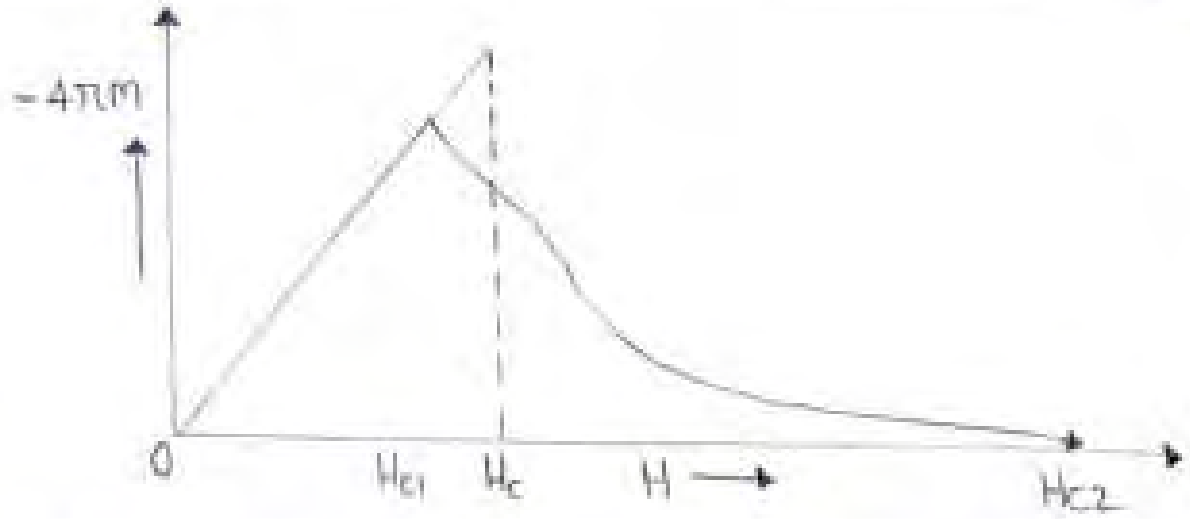



Fig. 11.4: Magnetization versus magnetic field is plotted for a Type-II superconductor Here there are two critical magnetic fields, $H_{c1}$ and $H_{c2}$.

$H > H_{c_2}$, it is a normal conductor. However, for $H_{c1} < H < H_{c2}$, the material has a mixed state. At $H_{c1}$ the magnetic field penetrates the material; and hence it does loses superconductivity with respect to magnetic properties. How even, the resistivity $\rho$ 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 where in embedded are magnetic flux lines. as shown in Fig. 11.5.

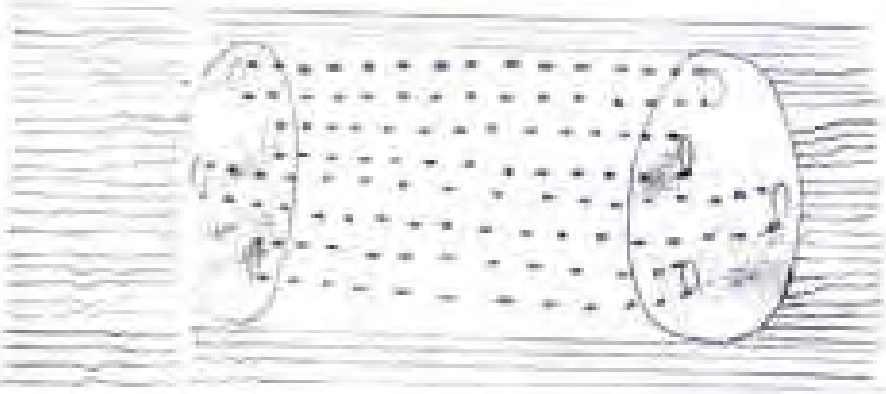


Fig. 11.5: Vertex lines (magnetic lines of force) in the mixed state

D. Isotope effect

In 1950, Emanuel Maxwell discovered the isotope effect, which is given by the relation $M^{\alpha}T_c = \text{const.}$.

where m the isotopic mass of the superconducting element & is it Power. The theoretical value of & is 0.5. The discovery led to the idea that the mechanism of superconductivity could involve phonons. The observed values of & are close to this value for most of the elemental superconductors.

E. superconducting gap

The main 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, implying that the superconducting ground state is separated by a gap from its 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 $T = 0K$. The gap is plotted as a function of temperature in Fig. 11.6.

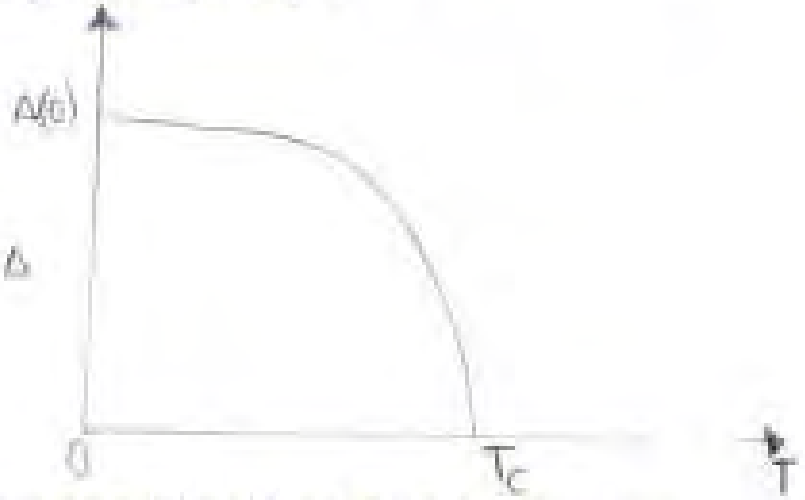



Fig 11.6: The superconducting gap is ploatted as a function of temperature. The gap vanishes at $T = T_c$ This is a phase diagram separating the superconducting phase from the normal phase.

F. Specific heat of superconductors.

The specific heat below the increases as a function of T

exponentially and is proportional to $e^{-\Delta/k_BT}$. It is shown in fig. 11.7 : Longer the gap, smaller is the specific heat.

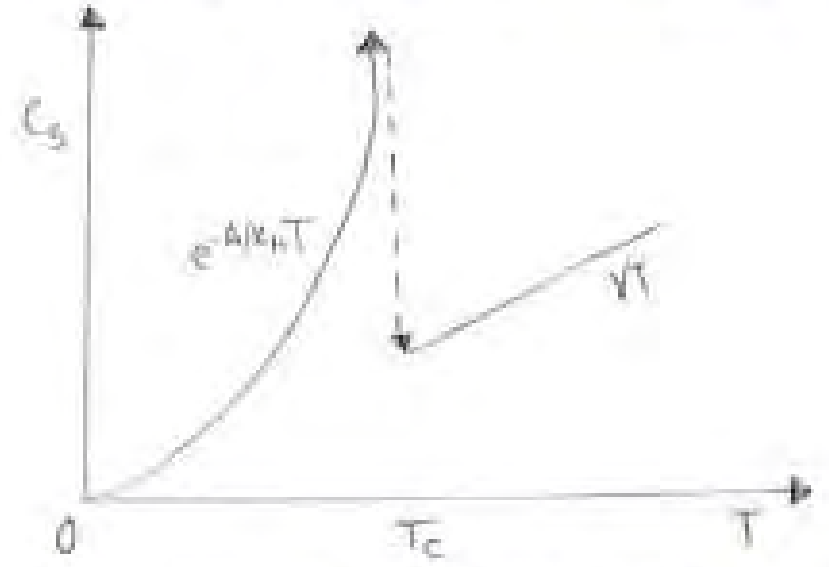



Fig. 11.7 The variation of the specific heat in a superconductor for $T_c$.

## 11.3 THERMODYNAMICS OF SUPERCONDUCTING PHASE TRANSITION

In this section we shall discuss the thermodynamics of the superconducting phase transition by analysing the free energy, enthropy and the specific heat in both 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 enthopy and m is the magnetization. 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,

$$dG_N(T,H) = 0, \tag{11.7}$$

where $G_N$ is the normal state free energy. Integrating both sides, we have $G_N(T,H) = G_N(T,0)$ (11.8)

implying the field independent of $G_N$.

Superconducting state:

In the superconducting state, at constant temperature, Eq. (11.6) becomes, using $m = -H/4\pi$, $dG_s = \frac{1}{4\pi} H dH$ (11.9)

where the subscripts stand 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 magnetic field $H_c$.

$G_s(T,H_c) = G_N(T,H_c) = G_N(T,0)$.

using Eq. (11.11) in (11.10), we have

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

Thus at critical magnetic field, the free energy of the superconducting state is less than that in the normal state, implying the stability of the former over the latter. A plot of $G_s(T,H)$ as a function of $H$ is shown in fig. (11.8).

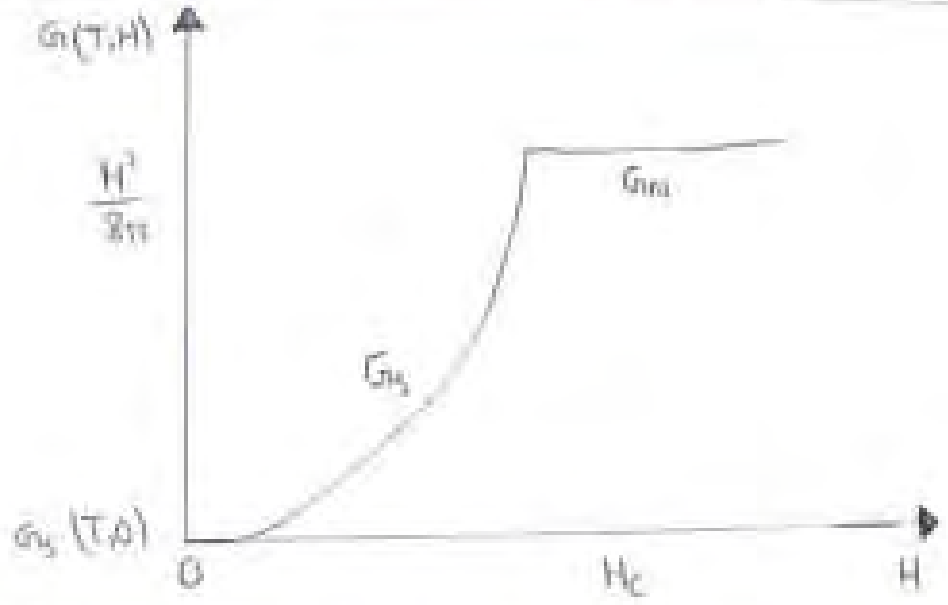



Fig. 11.8 : free energy in the superconducting and normal states. in the superconducting state the free energy varies quadratically with the magnetic field up to $H_c$ and is constant in the normal state.

Enthophy

At the chitical magnetic field, the enthopy ols the superconducting state to the normal state. Thus we have $dG_S = dG_N$. From Eq. (11.6), we have

$$-S_N dT = -S_S dT + \frac{H_c}{4\pi} dH_c \quad (11.13)$$

leding to

$$S_S - S_N = \frac{H_c}{4\pi} \frac{dH_c}{dT} \quad (11.14)$$

From Eq. (11.1) it is easily seen that the dibbebential quantity is negative implying that $S_N > S_S$. since enthopy denotes disorder, the superconducten state is more ordered than the normal state.

Specibic heat

Dibbebentiating Eq. (11.14) with nespect to temperature at constant field and multiplying by T to both sides, we obtain

$$T\left(\frac{dS_s}{dT}\right) - T\left(\frac{dS_N}{dT}\right) = \frac{T}{4\pi}\frac{a}{dT}\left[H_c - \frac{dH_c}{dT}\right] \qquad (11.15)$$

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

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

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

and we see a finite discontinuity between $C_s$ and $C_N$, as shown in fig 11.16. Thus the transition from superconducting state to the normal state in second order.

## 11.4 ELECTRODYNAMICS : LONDON EQUATION

We have seen from 11.28, that ohm's law together with the maxwell's equation

$\vec{\nabla} \times \vec{E} = -\frac{1}{c}\frac{\partial \vec{B}}{\partial t}$ does not give meissner effect. Since we do not change the maxwell's equation the need for an alternative expression for the current density arises. In 1935 F. London and H. London showed that the current density in a superconduction is given by

$$\vec{J} = -\frac{c}{4\pi\lambda_1^2}\vec{A}(\vec{r}) \qquad (11.17)$$

where $\vec{A}$ is the magnetic vector potential, c velocity of light and $\lambda_1$ is now known as the London penetration depth. We shall now derive an expression for it.

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 $m\vec{v} = -e\vec{E}$. Substitution of this in Eq. (11.18) leads to $\vec{J} = \frac{ne^2}{m}E$. Taking curl of both sides and using the aforementioned maxwell equation, we obtain

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

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

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

which leads to

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

from which we obtain

$$\vec{J} + \frac{ne^2}{mc}\vec{A} = 0; \Rightarrow \vec{J} = -\frac{ne^2}{mc}\vec{A} \qquad (11.22)$$

From Eqs. (11.17) and (11.22), we obtain an expression for the $\lambda$, as

$$\lambda_1 = \sqrt{\frac{mc^2}{4\pi ne^2}} \qquad (11.23)$$

In order to understand the meaning of $\lambda_1$ and the meissen effect, we consider the following maxwell's equation

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

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

$$\vec{\nabla} \times \vec{H} = \frac{4\pi}{c}\vec{J}. \qquad (11.26)$$

Taking curl of both sides and using Eq. (11.17), we have

$$\nabla^2 \vec{H} = \frac{1}{\lambda_1^2} \vec{H} \qquad (11.27)$$

which, in one dimension, becomes

$$\frac{d^2 H}{dx^2} = \frac{1}{\lambda_1^2} H, \qquad (11.28)$$

which, when solved gives

$$H(x) = H(0) e^{\frac{x}{\lambda_1}} \qquad (11.29)$$

The magnetic field decreases as a function of x. $\lambda_1$ is the range of the magnetic field penetration in the superconducting specimen. it has been estimated to be equal to $\sim 10^{-6}$ 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. Fig. 11.9. Thus we obtain meissner effect from London's equation


Fig 11.9: The magnetic flux in a superconductor is quantized. we consider a cylindrical specimen.

## COHERENCE LENGTH

Another length scale was introduced by English Physicist A. B. Pippard. We have seen in the preceding section that the London equation is a local one. Pippard's coherence length is a measure of the extent of the radial integration of the magnetic vector potential to obtain an average value of the current density in London's equation. It is also a measure each of the transition layer between the normal state and the superconducting state.

In a superconducting transition electron which lie in an energy range of $2\Delta$ near the fermi surface are affected

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

Here $2\Delta$ is the measure of the superconducting gap. Suppose the state of the system is affected is $k \to k + \delta k$, where $\delta k$ is an infinitesimal change in the wave vector. Neglecting the second order terms in $\delta k$, the change in energy becomes $\frac{\hbar^2 k}{m}\delta k$. The superconducting state would be stable if this change does not exceed $2\Delta$. Thus, substituting $k$ by $k_0$ we obtain the coherence length $\xi_0$ as

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

Problem: Derive Eq (11.31) by modulating the plane wave function $e^{ikx}$ by $\frac{1}{\sqrt{2}}\left(e^{ikx} + e^{i(\kappa+k)x}\right)$ and equating the change in energy to $\Delta$.

## QUALITATIVE ASPECTS OF BCS THEORY

A convincing theory of superconductivity was formulated by John Bardeen, Leon Cooper and J.R. Schrieffer in 1958 and published in Physical Review: Bardeen, J., Cooper, L.N., Schrieffer, J.R. Physical Review 106(1): 162-164; Physical Review 108(5): 1175-1204. Despite its limitation, the theory proved extremely successful in explaining the conventional materials was discovered. We shall now describe the salient features of this theory and its accomplishments.

1. Superconductivity occurs due to an attractive interaction between two electrons mediated by a phonon. The idea received its impetus from the isotope effect. An electron passing by positive charge density around it increases, which in turn attracts another electron. In the process electrons come closer to each other.

2. The two electrons as a result form a pair, known as Cooper pair. These electrons have opposite spins and opposite momenta and are represented by $(\vec{k}\uparrow, -\vec{k}\downarrow)$, $\vec{k}$ being the electronic wave vector. The pair has a spin-singlet state and zero momentum. Thus the pair has attributes of a boson, and zero momentum implies a condensate.

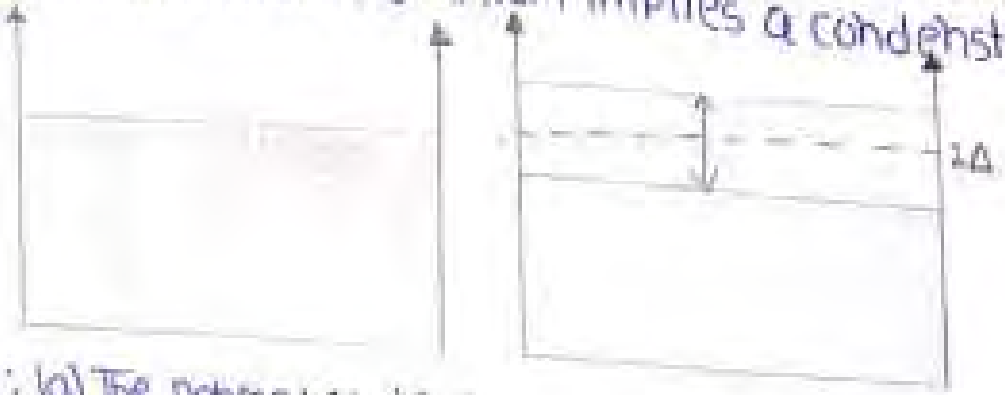



FIG 11.10: (a) The normal state of a superconductor where the electrons are occupied upto fermi level (b) Because of pairing a gap of magnitude 2Δ appears near the Fermi level.

3. as a consequence of the pairing, the ground state of the system is lowered and separated from the excited state by an energy gap of magnitude $2\Delta$, as shown in Fig 11.10 At

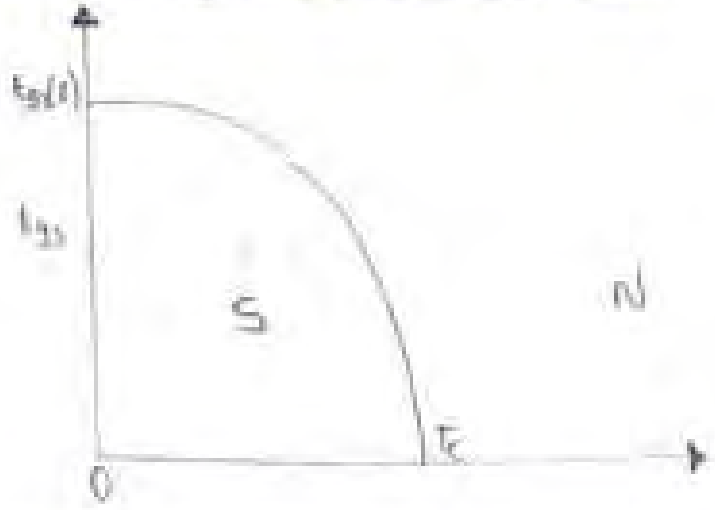



Fig 11.11 : Super conducting energy gap versus temperature. S and N represent the superconducting and normal phases respectively.

first sight it might appear that the superconducting state has higher energy because of the excited state above the fermi level. The increase in energy is, however, more than compensated for the the binding between two electrons occurs. The superconducting energy gap is given by

$$E_{gs} = 3.2 K_B T_c \left(1 - \frac{T}{T_c}\right)^{1/2}$$

It describes a phase diagram, Fig.11.11. at $T = 0k$, the gap is of the order of $K_B T_c$.

4. pending the discussion of a rigorous theory to a later section, we shall now focus on the accomplishments of the theory. The theory explains most of the experimental, observation as regard the conventional superconductors such as the meissner effect, London equation and coherence length

which follow as natural consequences of the theory.

5. The superconducting transition temperature is found to be

$$T_c = 1.14\,\Theta_D e^{-\frac{1}{UD(E_f)}}$$

where $\Theta_D$ is the Debye temperature, U the attractive electron interaction and $D(E_f)$ is the density of states at the fermi surface. 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.

we shall derive some of these quantities later.

## TUNNELING PHENOMENA IN SUPERCONDUCTORS

In this section we shall discuss tunneling phenomena in superconductors. systems involve Junctions we have previously discussed tunneling in semiconductor Junctions, the Esaki diode, Here we shall consider three type of Junctions: all the Junction are separated by thin insulating barriers of width $\leq 10\,A^0$. First let us consider the Junction of two metals, M1 and $M_2$, separated by a thin insulating barrier, Fig. 11.2.

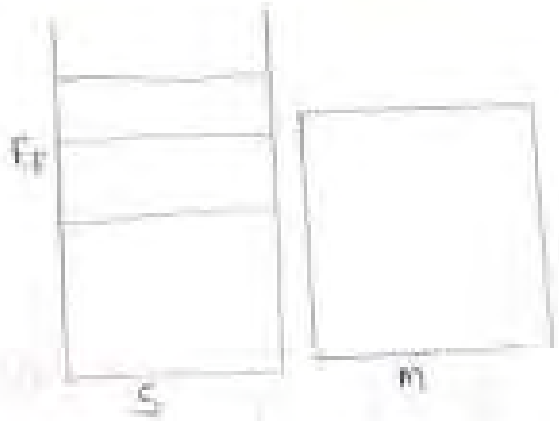

Fig: 11.2: two metal Junctions, separated by a thin insulating barrier.

The metals distinguish by their positions of fermi levels. $E_{F_1}$ is the fermi level of metal M1 and $E_{F_2}$ is that of M2. $E_{F_1} < E_{F_2}$. Because of the unequal positions of the fermi levels, the Junction is in a

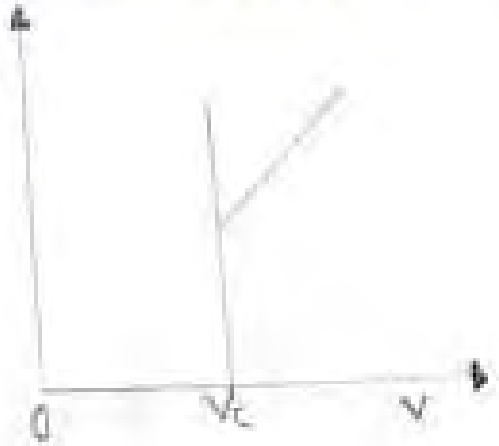
non-equilibrium state. Let us connect it to a voltage source, V. Electron from m1 will tunnel to m2, until equilibrium is reached, equalizing the Fermi levels on both sides of the Junction. The resulting current, I, when plotted against V would show a linear ohmic behavior.

## GIAVER TUNNELING

We shall now consider a Junction of a superconductor and a metal, separated by a thin insulating barrier. The situation is shown is Fig: 11.13a. The Junction is connected to a voltage source. As long as the voltage is less than Cooper pair breaking voltage, $V_c$, there is no current flow from the superconducting reg on to the normal region. At $V_c$, the energy becomes $2eV_c$, 2e being the charge of 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. Thus Giaver's single particle tunneling phenomenon can be used for the experimental determination on of the superconducting gap. The I versus V curve is shown in Fig. 11.13b.




(a)




(b)

Fig: 11.13(a) A Junction of a superconducter S and metall M. These are separated by a thin insulating behavior. The Fermi level is at the middle of the superconductor gap in S and is the highest occupied level in M. (b) the current versus voltage curve. for $V < V_c$ the current is almost zero; at $V = V_c$ the current suddenly rises because of the breaking of cooper pairs and subsequent tunneling electrons from S side to M side. for $V > V_c$, the current follows a linear behavior.

## JOSEPHSON TUNNELING

B.D. Josephson showed that if one forms a Junctions of two superconductor 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. S1 and S2 are two superconductors, separated by a thin insulating barrier of width, $d \leq 10\ A^\circ$. Both superconductors are identical.


Fig. 11.14: S1 and S2 are two superconductors, separated by a thin insulating barrier of width, $d \leq 10\ A^\circ$.

suppose $\psi_1$ and $\psi_2$ are the probability amplitudes of the cooper pairs in $S_1$ and $S_2$ respectively. Let $\theta_1$ and $\theta_2$ be the phases associated with these amplitudes. Equations of motion for the tunneling are

$$i\hbar \frac{\partial \psi_1}{\partial t} = \hbar T \psi_2 \qquad (11.34)$$

and

$$i\hbar \frac{\partial \psi_2}{\partial t} = \hbar T \psi_1, \qquad (11.35)$$

where $\hbar T$ is the tunneling energy. Let us try with the following solutions: $\psi_1 = \sqrt{n_1} e^{i\theta_1}$,

(11.36)

and $\hbar T$ is the tunneling energy. Let us try with the following solutions

$$\psi_2 = \sqrt{n_2} e^{i\theta_2}, \qquad (11.37)$$

where $n_1$ and $n_2$ are the concentration of cooper pairs in S1 and S2 respectively. Here both conc. and phases are time-dependent. Substituting Eqns (11.36) and (11.37) in Eq. (11.34) and comparing the real and imaginary parts from both sides, we obtain

$$\frac{\partial n_1}{\partial t} = 2T \sqrt{n_1 n_2} \sin\delta \qquad (11.38)$$

and

$$\frac{\partial \theta_1}{\partial t} = -T \sqrt{\frac{n_2}{n_1}} \cos\delta, \qquad (11.39)$$

where

$$\delta = \theta_2 - \theta_1 \qquad (11.40)$$

Similarly substituting Eq.s (11.36) and (11.37) in Eq. (11.35) and following the same procedure, we obtain

$$\frac{\delta n_2}{\delta t} = -2T \sqrt{n_1 n_2} \sin\delta \qquad (11.41)$$

And

$$\frac{\partial \theta_2}{\partial t} = -T\sqrt{\frac{n_1}{n_2}}\cos\delta. \qquad (11.42)$$

Since rates of changes are $n_1$ & $n_2$ are opposite to each other, Eqs. (11.38) and (11.41) differ by a sign for $n_1 \approx n_2$

$$\frac{\partial \theta_2}{\partial t} = \frac{\partial \theta_1}{\partial t} \Rightarrow \frac{\partial(\theta_2 - \theta_1)}{\partial t} = 0 \Rightarrow \frac{\partial \delta}{\partial t} = 0 \qquad (11.43)$$

Thus $\delta$ is independent of time. The currents 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

$$I = I_0 \sin\delta, \qquad (11.44)$$

which is a direct current. Here $I_0$ is proportional to the transfer our tunneling energy, T. The relevant I versus V curve V is shown in Fig. 11.15.

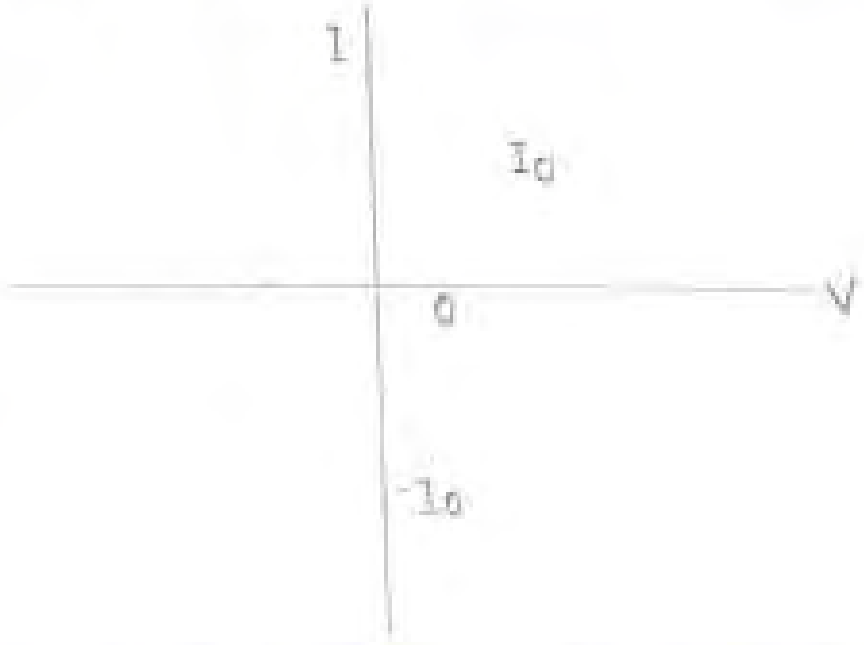



Fig 11.15: The current oscillates between $I_0$ and $-I_0$ at V=0, demonstrating the DC Josephson effect.

## AC JOSEPHON EFFECT

now let us connect the Junction to a voltage source of Potential of V volts. The energy difference across the Junction is qV where q is the charge of the Cooper Pair. Thus the energy difference is $-2eV$. Accordingly the modified equations of motion are

$$i\hbar \frac{\partial \psi_1}{\partial t} = \hbar T \psi_2 - eV\psi_1 \qquad (11.45)$$

and

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

Substituting Eqs (11.36) and (11.37) in eqs (11.45) and (11.46) sucessively and Comparing the real and imaginary Part of the resulting equation, we obtain eqs (11.38) and (11.41) without any change and

$$\frac{\partial \theta_1}{\partial t} = -T\sqrt{\frac{n_2}{n_1}}\cos\delta + \frac{e'}{i} \qquad (11.47)$$

And

$$\frac{\partial \theta_2}{\partial t} = -T\sqrt{\frac{n_1}{n_2}}\cos\delta - \frac{e'}{i} \qquad (11.48)$$

From Eq. (11.47) and (11.48), we have

$$\frac{\partial(\theta_2 - \theta_1)}{\partial_1} = -\frac{2eV}{\hbar} = \frac{\partial\delta}{\partial t} = -\frac{2eV}{\hbar} \qquad (11.49)$$

Integrating Eq. (11.49)

$$\delta(t) = \delta(0) - \omega t. \qquad (11.50)$$

where

$$\omega_0 = \frac{2eV}{\hbar} \qquad (11.51)$$

if V = 1μV, then the frequency

$$\nu = \omega/2\pi = 2\times1.6\times10^{-9}\,C \times 1\times10^{-6}\,JC^{-1}/6.626\times10^{-34}\,Js = 482.9\,mHz.$$