

"Dissemination of Education for Knowledge, Science and Culture"

-Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha

Dattajirao Kadam Arts, Science & Commerce, Ichalkaranji

Department of Physics (Academic Year 2024-25)

B. Sc. III Seminar (Semester-VI)

Notice

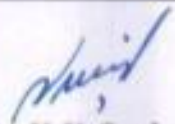
Date: 03/12/2024

All students of B. Sc. III (Physics) are here by informed that their **Seminars of Semester-VI** will be conducted. A seminar report is a formal document summarizing the content presented during a seminar. The topic of seminars is as per given table. It is compulsory to all students to attend the same.

Sr. No.	Roll No.	Name of students	Topic of Seminar
1	7064	Miss. Chhatre Sumati Sagar	Cyclotron (Construction, Principle and Working)
2	7065	Miss. Chikorde Aditi Pravin	Classification of elementary particles
3	7066	Miss. Desai Anushka Gunaji	Messiner effect and type I and type II superconductor
4	7067	Miss. Kamble Tejaswini Nandkishor	Black hole
5	7068	Mr. Khot Omkar Sukumar	Origin of solar system
6	7069	Miss. Magadum Dipali Baiaso	Hysteresis loop for ferromagnetic material
7	7070	Miss. Mulla Kulsum Najir	Miller indices
8	7071	Miss. Nadugire Amruta Annappa	X - ray diffraction
9	7072	Miss. Ranade Madhura Prasad	Biomass energy resources
10	7073	Mr. Raval Pavan Gurudev	GM Counter
11	7095	Miss. Sasane Pallavi Shivaji	Wind Energy

Date: From 08 January 2025

Venue: B. Sc. III Classroom (Room no. 92)
and Digital Classroom (Room no. 38)


(Dr. V. V. Ganbavle)

HEAD

Dattajirao Kadam A.S.C. College,
Ichalkaranji

-Shikshan Maharshi Dr. Bapuji Salunkhe

Dattajirao Kadam Arts, Science & Commerce, Ichalkaranji

B. Sc. III Seminar, 2024-2025 (Semester VI)
Attendance Sheet

Ranade Madhura-P
"Biomass energy
resources"

Raval Pawan-G
"GM Counter"

Sarane Pallavi-S
"Wind energy"

-Shikshan Maharshi Dr. Bapuji Salunkhe

Dattajirao Kadam Arts, Science & Commerce, Ichalkaranji

B. Sc. III Seminar, 2024-2025 (Semester VI)
Attendance Sheet

[illegible]

HEAD,
Department of Physics
Dattajirao Kadam A.S.C. College,
Ichalkaranji.

David
HEAD,
Department of Physics
Dattaram Kadam A.S.C. College,
Ichalkaranji

Dissemination of Education for Knowledge, Science and Culture"

- Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

**DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE
COLLEGE, ICHALKARANJI**

DEPARTMENT OF PHYSICS

SEMESTER REPORT (SEMESTER - VI)

Name: Miss. Anushka Gunaji Desai

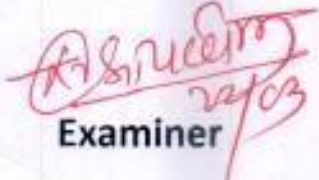
Class: B.Sc. III

Roll no.: 7066

Seminar Subject: Meissner Effect, Type of Superconductor

Subject Teacher: Mr. S.D. Pathan


Subject Teacher


Examiner


**Head of Department
HEAD,**

Department of Physics
Dattajirao Kadam A.S.C College,
Ichalkaranji.





Dissemination of Education for Knowledge, Science and Culture"

-Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE

COLLEGE, ICHALKARANJI

AFFILIATED TO SHIVAJI UNIVERSITY, KOLHAPUR



श्री स्वामी विवेकानंद शिकशन संस्था

DEPARTMENT OF PHYSICS

BACHELOR OF SCIENCE PART III, SEMESTER -VI

Seminar on

"Meissner effect, type -1 and type -2 Superconductors"

by

Miss. Anushka Desai



Contents

- A Superconductor
- The Meissner effect
- Type of superconductor
(type 1 and type 2 superconductor)
- Comparison between type 1 and 2 Superconductor

A Superconductor

"The phenomenon of disappearance of electric resistance of material below certain temperature is called as superconductivity"

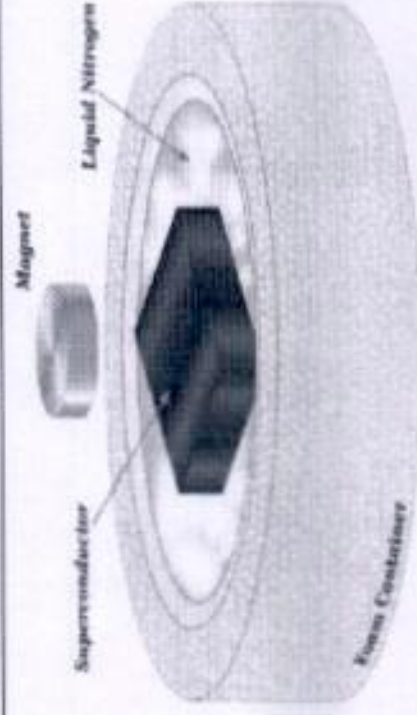
"The material in this state is called as superconductor"

The temperature at which normal metal becomes superconductor is known as critical temperature T_c

Liquid nitrogen (B.P.) = -196°C

$$\boxed{R=0} \Rightarrow \text{Vanishes}$$
$$P = I^2 R$$
$$R = 0$$
$$P = I^2 \times 0$$
$$\boxed{P=0}$$

P - electric power
I - electric current
R - Resistance



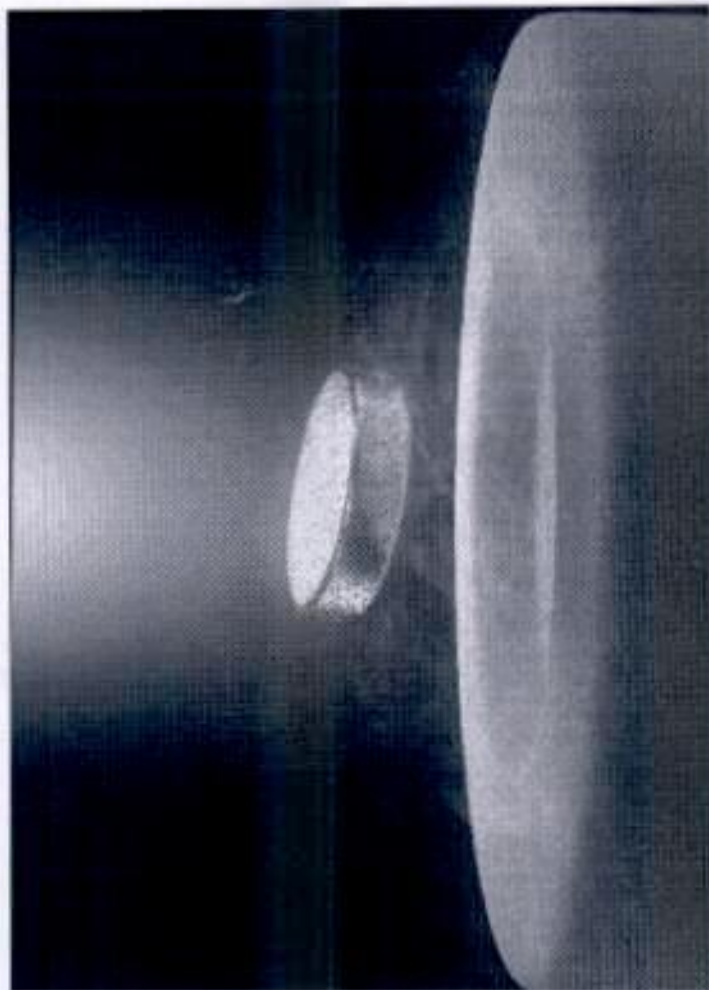
The Meissner effect

So far everything we have discussed is equally true for a "Perfect Conductor" as well as a "Superconductor"

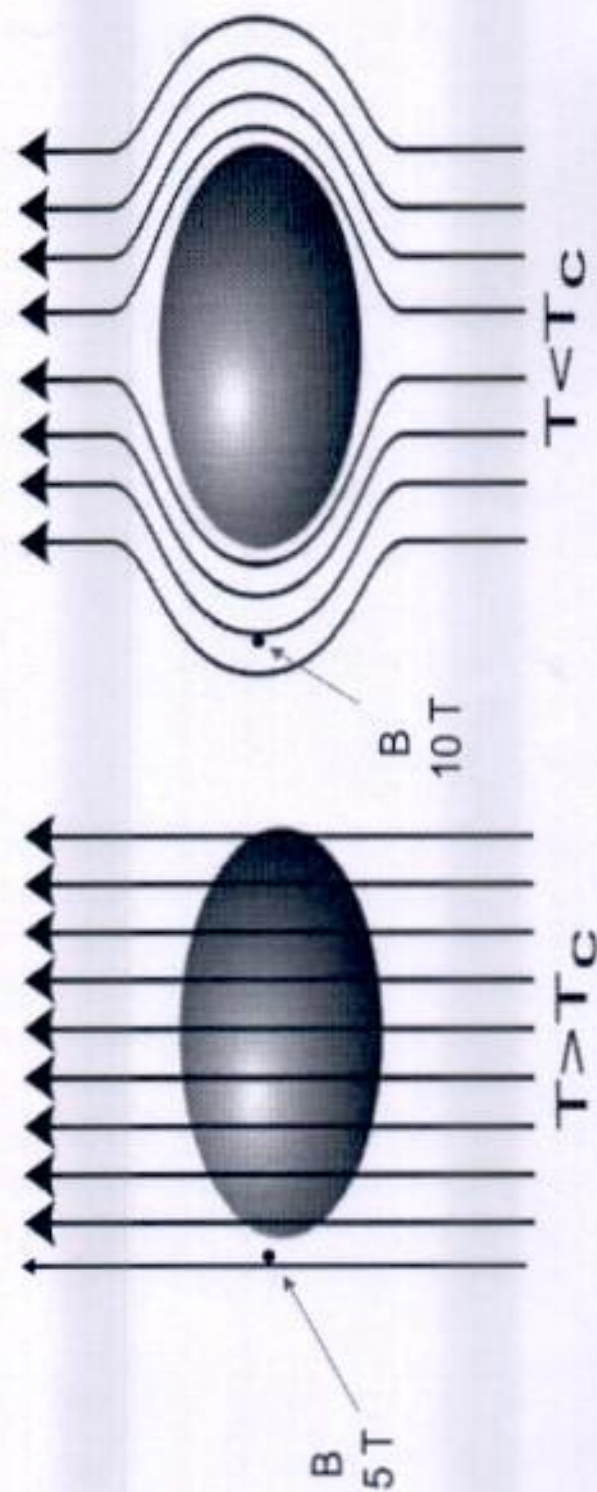
In 1933 Meissner and Oschenfeld made a discovery which distinguished between the two

The Meissner effect

*"A Superconductor
excludes all magnetic flux
from its interior"*



When superconductors, are cooled down below the critical temperature, they expel magnetic field and do not allow the magnetic field to penetrate inside them. This phenomenon in superconductor is called as Meissner effect



$$B = \mu_0 (H + M) = 0$$

$$\text{i.e. } H = -M$$

Hence, susceptibility is given by,

$$\chi = \frac{M}{H} = -1$$

Thus, *superconductor is perfect diamagnet.*

Though a superconductor behaves as perfect conductor as well as diamagnet, it behaves differently under different conditions.

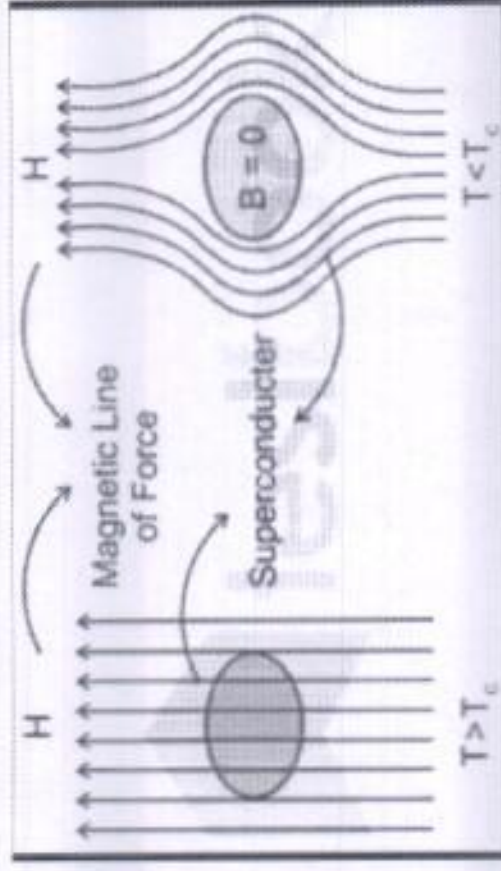
The resistivity of perfect conductor is zero,

$$\text{i.e. } \rho = 0$$

$\therefore$ from Ohm's law, $E = \rho J$

If $\rho = 0$, $E = 0$ i.e. no electric field exist inside the perfect conductor.

Now using Maxwell's equation.



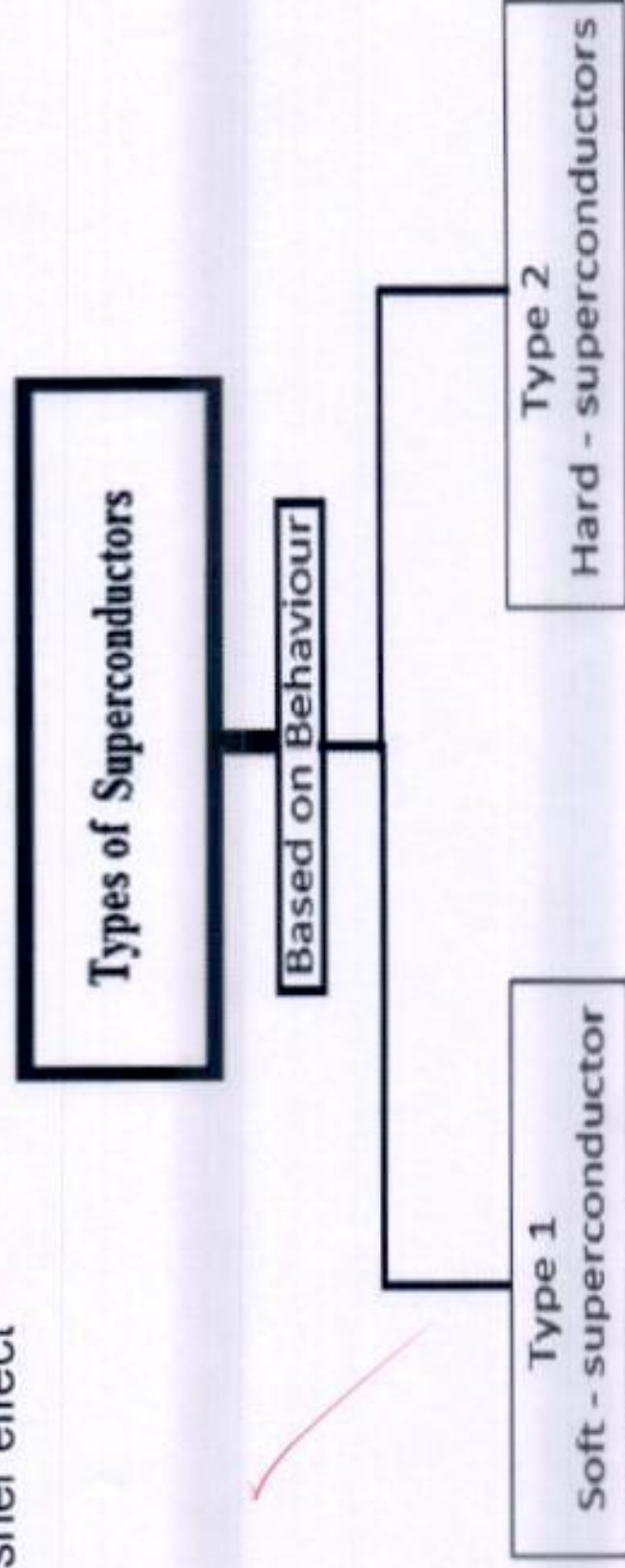
$$\nabla \times E = - \frac{\partial B}{\partial t}$$

$$\Rightarrow \frac{\partial B}{\partial t} = 0$$

i.e. $B = \text{constant}$

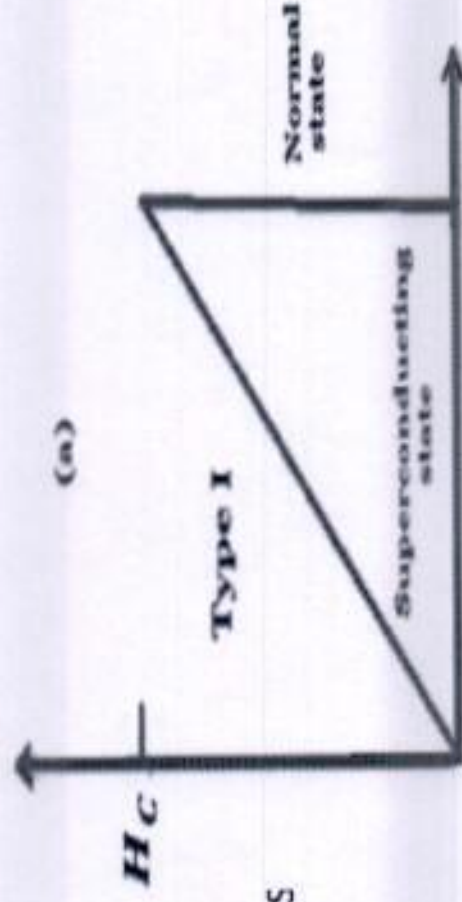
Type of Superconductor

Superconductor can be classified as a type-1 and type-2 depending upon their behaviour in an external magnetic field. That means how they follow the Meissner effect



Type-1 Superconductor

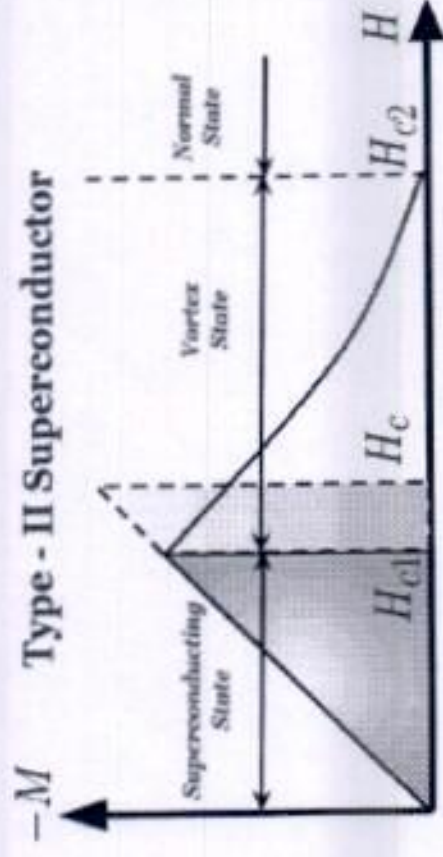
- These superconductor are called as soft superconductor
- Only one critical magnetic field exist for the superconductor
- The critical field value is very low
- The superconductor exhibits perfect and complete Meissner effect
- The current flow through the surface only



Magnetization curve for type-1 Superconductor

Type -2 Superconductor

- These superconductor are called as hard superconductor
- Two critical fields H_{c1} and H_{c2} exist for these superconductor
- The critical field value is very high
- The superconductor do not exhibit perfect and complete Meissner effect
- It is found that current flow throughout the material



Magnetization curve for type-2 superconductor

Comparison between type 1 and 2 superconductor

Type -1 Superconductor

- Soft superconductor
- Exhibit Meissner effect
- One $H_C = 0.1$ tesla
- No mixed state present
- The critical field value is very low

Type -2 Superconductor

- Hard superconductor
- Do not exhibit Meissner effect
- Two H_{C1} and $H_{C2} = 10$ tesla
- Mixed state present
- The critical field value is very high

Thank you

Dissemination of Education for Knowledge, Science and Culture"

- Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

**DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE
COLLEGE, ICHALKARANJI**

DEPARTMENT OF PHYSICS

SEMESTER REPORT (SEMESTER - VI)

Name: Miss. Madhura Prasad Ranade

Class: B.Sc. III

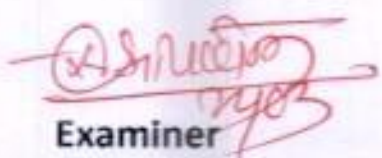
Roll no.: 7072

Seminar Subject: Biomass Energy

Subject Teacher: Dr. V. V. Ganbavle




Subject Teacher


Examiner


Head of Department

HEAD,
Department of Physics
Dattajirao Kadam A.S.C College,
Ichalkaranji.



Dissemination of Education for Knowledge, Science and Culture"

- Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE

COLLEGE, ICHALKARANJI

AFFILIATED TO SHIVAJI UNIVERSITY, KOLHAPUR

DEPARTMENT OF PHYSICS

BACHELOR OF SCIENCE PART III, SEMESTER -VI

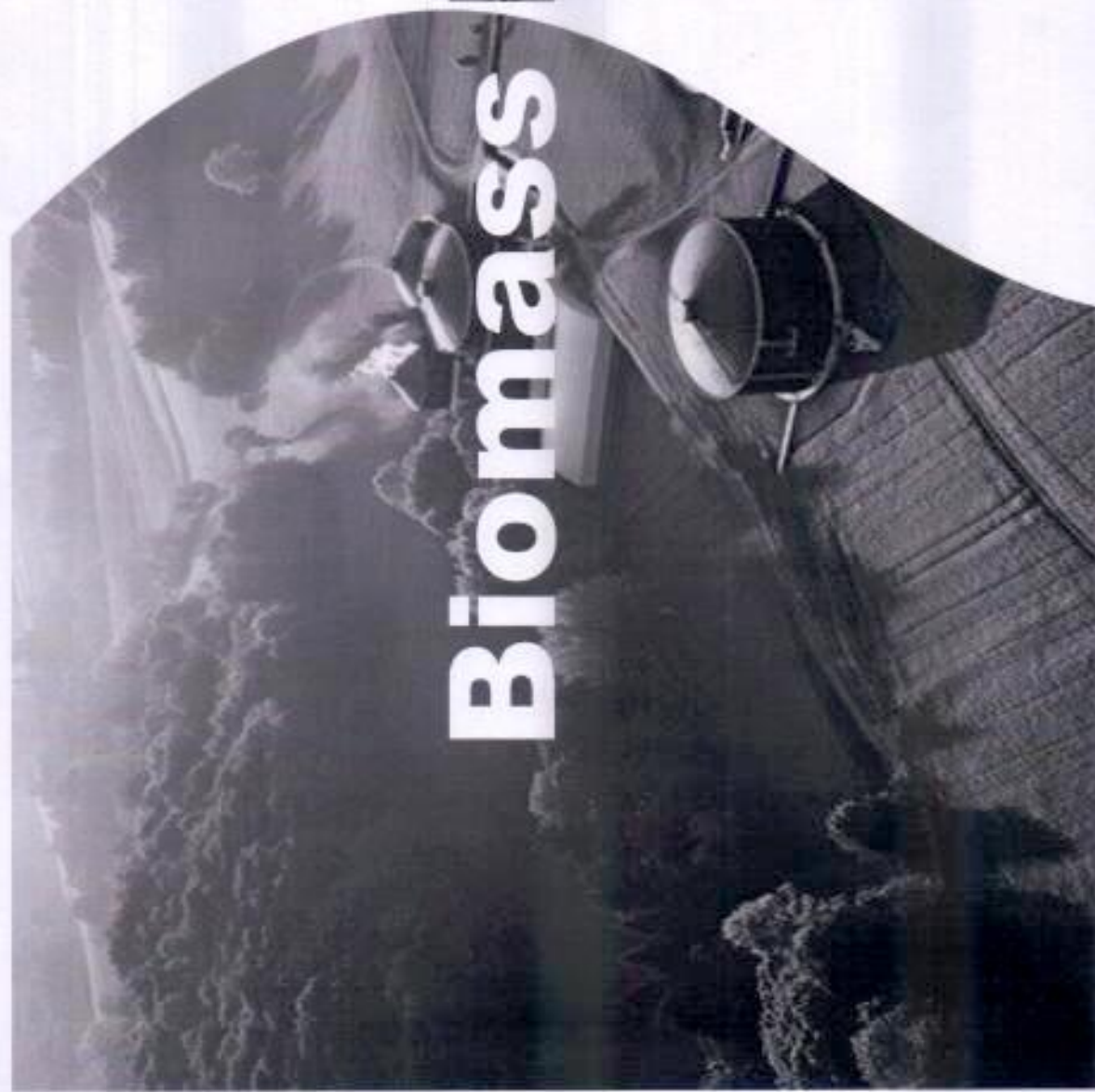
Seminar on

"BIOMASS ENERGY"

by

Miss. Madhura Ranade





Biomass Energy

Content

- Introduction
- Photosynthesis Process
- Biomass Resources
- Algae as Biomass
- Biomass Conversion Process
 - 1. Anaerobic Digestion Process
 - 2. Fermentation Process

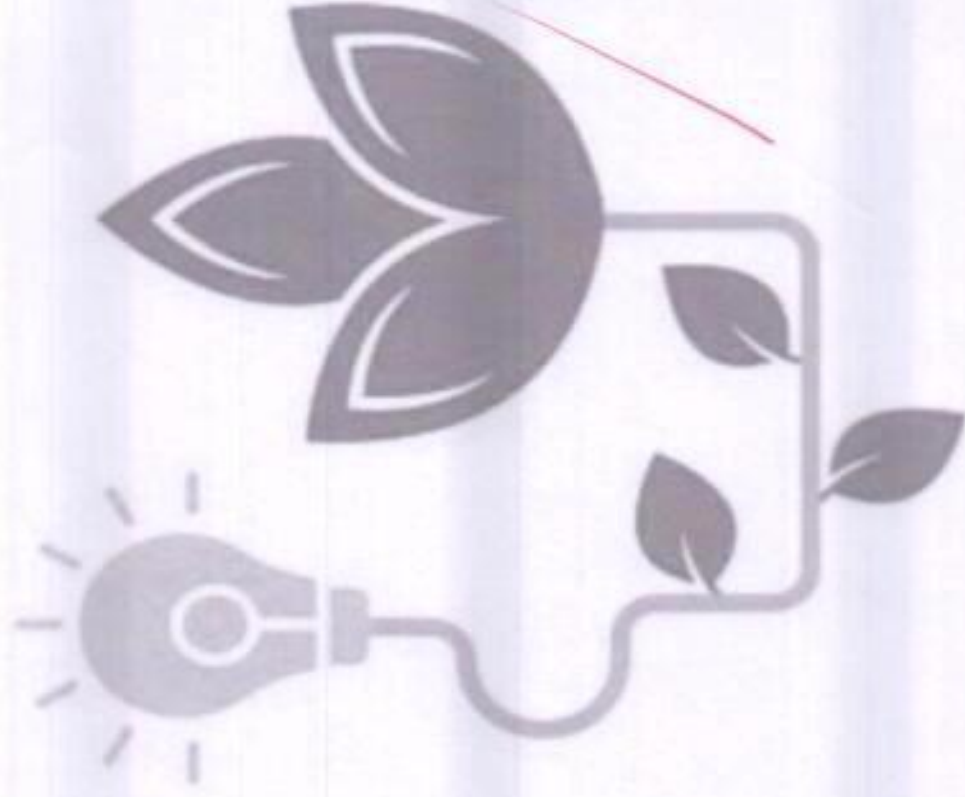


Introduction

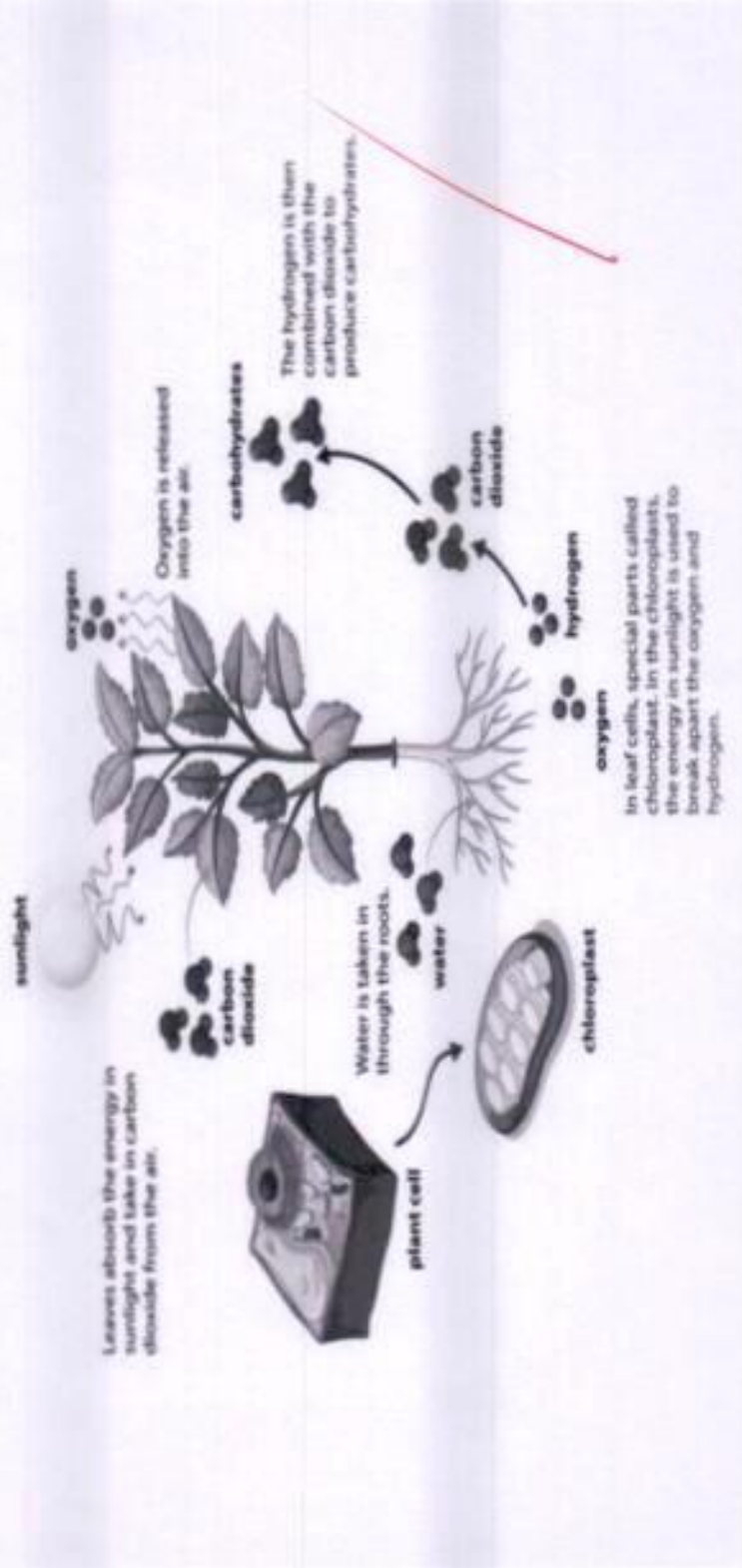
Biomass refers to organic matter derived from plants and animals, encompassing living and recently deceased organisms.

The energy obtained from biomass is called **Biomass Energy**. The raw organic matter obtained from nature for extracting usable energy is called **Biomass Energy Resource**.

Photosynthesis is the origin of Biomass production. It serves as a renewable energy source, harnessed by converting its chemical energy into heat or electricity.

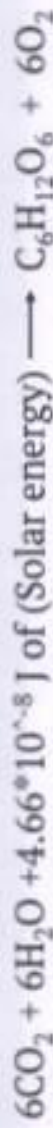


The Process and Role of Photosynthesis



The formation of biomass by photosynthesis can be shown as :

{CO₂ gas from atmosphere + Chlorophyll in plants + Moisture + Solar Energy } → Biomass + Oxygen



Biomass Oxygen

Biomass Resource

Biomass from Cultivated crops

- For energy farming special species are cultivated through genetic research.
- They have high energy density and are renewable.

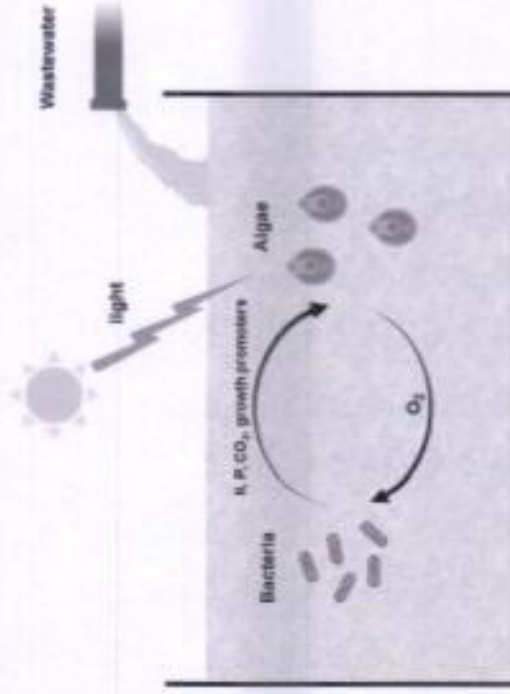
Biomass from Waste Organic Matter

- Such type of resources convert organic wastes into intermediate / secondary energy forms such as heat, biogas, alcohol, fuels, chemicals, etc.



Algae as Biomass

This is another important renewable resource of energy produced from photosynthesis.



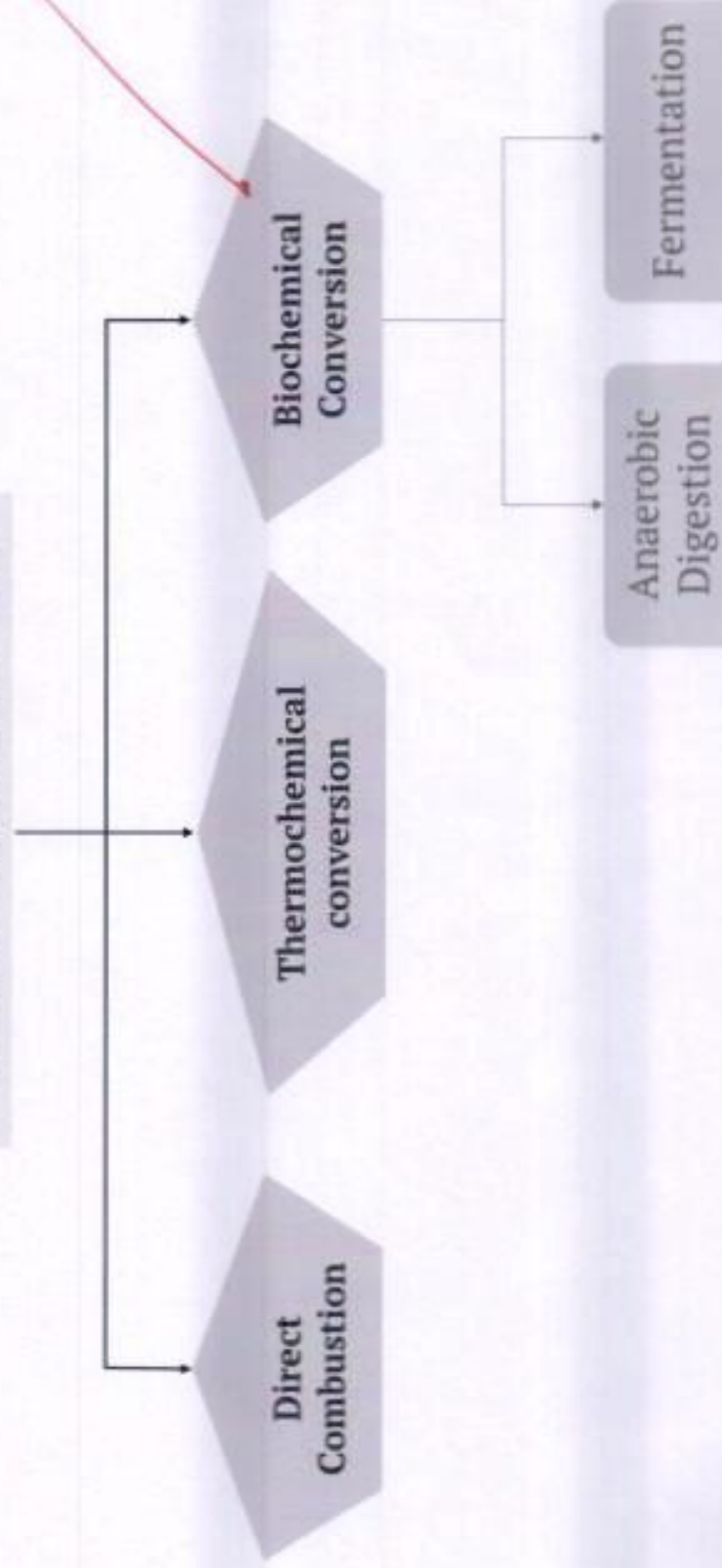
Growth of Algae cell in Algae Pond

Algae is kind of pack of a number of very small plants. It grows very fast and the organic extract from biogas plants is a good food for it. This algae is kept on a special tank called **Algae pond**. The process of algae to biomass is shown besides. Technologies are being developed to form **algae farms** to reap **algae crops** on large scale.

Types of Biomass Conversion Process

Conversion of biomass into usable energy is the main aim of biomass energy technology. Following are the 3 broadly categorized methods :

Biomass Conversion Process



Anaerobic digestion

- Anaerobe is a microscopic organism which can live and grow without external oxygen or air. When it is added to a biomass, it extracts oxygen by decomposing the biomass at low temperatures up to 65°C in presence of large proportion of moisture (about 80%). Thus, anaerobe digests the biomass; hence, the biochemical conversion involving digestion of biomass is called **Anaerobic digestion**.
- Through this process Biogas (Methane gas) is obtained. And used for heating water, coking, and sometimes for generating electrical power.

Simple Biogas plant or Gobar gas plant for producing domestic gas (methane) by anaerobic digestion is shown in fig. below.

- It consists of 3 components :

1. Digester
2. Gasholder
3. Distribution line and gas appliances

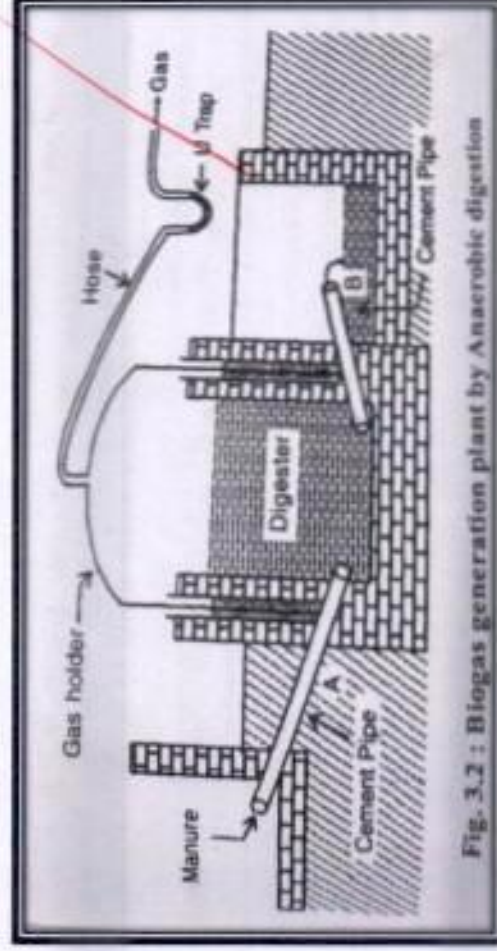


Fig. 3.2 : Biogas generation plant by Anaerobic digestion

Fermentation

- Fermentation is one of the oldest known chemical processes used by man to obtain liquor (ethyl alcohol). It can be used to obtain other products also.
- **Fermentation is a process of decomposition of organic matter by microorganisms, especially bacteria and yeast.** There are various types of fermentation process such as Ethanol Fermentation, Butanol-Isopropanol Fermentation, Methane Fermentation, Hydrogen Fermentation.

No.	Name of process	In-feed	Products
1	Ethanol Fermentation	Sugar cane, sweet beets, fruit juices, molasses, starch (cereals, potatoes cellulose)	Ethanol and CO ₂
2.	Butanol-Iso-propanol Fermentation	Carbohydrates mixed solvents	n-butane, isopropanol, acetone, ethanol
3.	Methane Fermentation	Organic wastes, carbohydrates, fats, proteins, sugars.	Acids : Acetic, Propionic, Formic, Aldehydes, lower alcohols, Ammonia, H ₂ S, Methane + CO ₂
4.	Hydrogen Fermentation		Hydrogen mixed with acids.

Fermentation Products

- Food products: from milk (yogurt, cheese, paneer)
from fruits (wine, beer, vinegar)
from vegetable (pickles, sauerkraut, soy sauce)
from meat (fermented sausages, salami)
- Industrial chemicals: solvents- acetone, butanol, ethanol, enzymes, amino acids
- Specialty chemicals: vitamins, pharmaceuticals

**THANK
YOU!**



"Dissemination of Education for Knowledge, Science and Culture"

-Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha

Dattajirao Kadam Arts, Science & Commerce, Ichalkaranji

Department of Physics

B. Sc. III Seminar Evaluation Report 2024-2025 (Semester VI)

Sr. No.	Roll No.	Name of students	Content of Knowledge (02Marks)	Presentation Skills (02Marks)	Engagement (02Marks)	Critical Thinking (02Marks)	Time Management (02Marks)	Total Marks (10Marks)
1	7064	Miss. CHHATRE SUMATI SAGAR	01	02	02	01	01	07
2	7065	Miss. CHIKORDE ADITI PRAVIN	02	01	01	02	02	08
3	7066	Miss. DESAI ANUSHKA GUNAJI	01	02	02	02	02	09
4	7067	Miss. KAMBLE TEJASWINI N	02	02	01	01	01	07
5	7068	Mr. KHOT OMKAR SUKUMAR	01	01	01	01	02	06
6	7069	Miss. MAGADUM DIPALI BAIASO	01	01	01	01	02	06
7	7070	Miss. MULLA KULSUM NAJIR	01	01	02	01	02	07
8	7071	Miss. NADUGIRE AMRUTA A	01	02	02	01	02	08
9	7072	Miss. RANADE MADHURA P	02	02	02	01	02	09
10	7073	Mr. RAVAL PAVAN GURUDEV	02	02	02	01	02	09
11	7095	Miss. SASANE PALLAVI SHIVAJI	01	01	01	01	02	06



[Signature]

(Dr. V. V. Ganbavle)

(Dr. V. S. Rawar)

(Dr. S. S. Kumbhar)

(Miss. V. S. Dhobale)

(Dr. V. V. Ganbavle)

HEAD,

Department of Physics
Dattajirao Kadam A.S.C. College,
Ichalkaranji.

B. Sc. III Seminars (2024-2025), Semester-VI

Miss. Aditi presenting her seminar on "Classification of elementary Particles"



Miss. Anushka explaining the Meissner Effect



Chirag
HEAD,
Department of Physics
Dattajirao Kadam A.S.C. College,
Ichalkaranji.



Miss. Dipti delivering her seminar on "Hysteresis Loop"



Miss. Madhura discussing "Biomass Energy"



[Signature]
HEAD,
Department of Physics
Dattajirao Kadam A.S.C. College,
Ichalkaranji



"Dissemination of Education for Knowledge, Science and Culture"

-Shikshan Maharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha, Kolhapur's

Dattajirao Kadam Arts, Science & Commerce College,

Ichalkaranji.



Department of Physics

B. Sc. III Seminar Report - Semester VI (2024-2025)

Date: 15/01/2025

The Department of Physics organized seminars for B. Sc. III students during **Semester-VI** of the academic year **2024-2025**. A total of **11** students delivered presentations on topics given by the department, each lasting 30 minutes. Some students delivered seminars using Black Board and some students by the PowerPoint Presentations (PPT). All students confidently presented lectures on subjects from the academic syllabus, such as and "**Nuclear and Particle Physics**", "**Solid State Physics**", "**Atoms, Molecules & Astrophysics**", and "**Energy Studies and Materials Science**". This seminar activity aims to enhance students' confidence, improve their teaching skills, and provide valuable teaching experience. The presentations were evaluated by the respective in-charge teacher, who provided constructive feedback and suggestions.

The seminar activity proved to be a valuable learning experience for B. Sc. III Physics students, contributing to both their personal and academic growth. The initiative succeeded in fostering a supportive environment for public speaking, critical thinking, and peer learning. The department plans to continue organizing similar activities to further enhance students' skills and confidence in future semesters.

Swati
HEAD,

Department of Physics
Dattajirao Kadam A.S.C. College,
Ichalkaranji.