

"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-V)

Notice

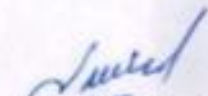
Date: 13/08/2024

All students of B.Sc. III (Physics) are hereby informed that their **Seminars of Semester-V** will be conducted. 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	Logic Gates
2	7065	Miss. Chikorde Aditi Pravin	Types of Constrains
3	7066	Miss. Desai Anushka Gunaji	Physical acceptable wave functions
4	7067	Miss. Kamble Tejaswini Nandkishor	Normalized wave functions
5	7068	Mr. Khot Omkar Sukumar	De-Morgans theorems
6	7069	Miss. Magadum Dipali Balaso	Newtons laws of motion
7	7070	Miss. Mulla Kulsum Najir	Conservation of linear momentum and energy
8	7071	Miss. Nadugire Amruta Annappa	Quantum numbers
9	7072	Miss. Ranade Madhura Prasad	Solution of second order linear differential equations
10	7073	Mr. Raval Pavan Gurudev	Difference between MB, BE and FD statistics
11	7095	Miss. Sasane Pallavi Shivaji	Black holes

Dates: Onward from 18 September 2024

Venue: B. Sc. III Classroom


(Dr. V. V. Ganbavle)

HEAD,

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

-Shikshan Maharshi Dr. Bapsuji Salunkhe

Dattajirao Kadam Arts, Science & Commerce, Ichalkaranji

Department of Physics

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

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

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"B. Sc. III Seminars, Semester-V (2024-25)"

""Miss. Madhura Ranade delivering an insightful seminar on Solution of second order linear differential equations!"

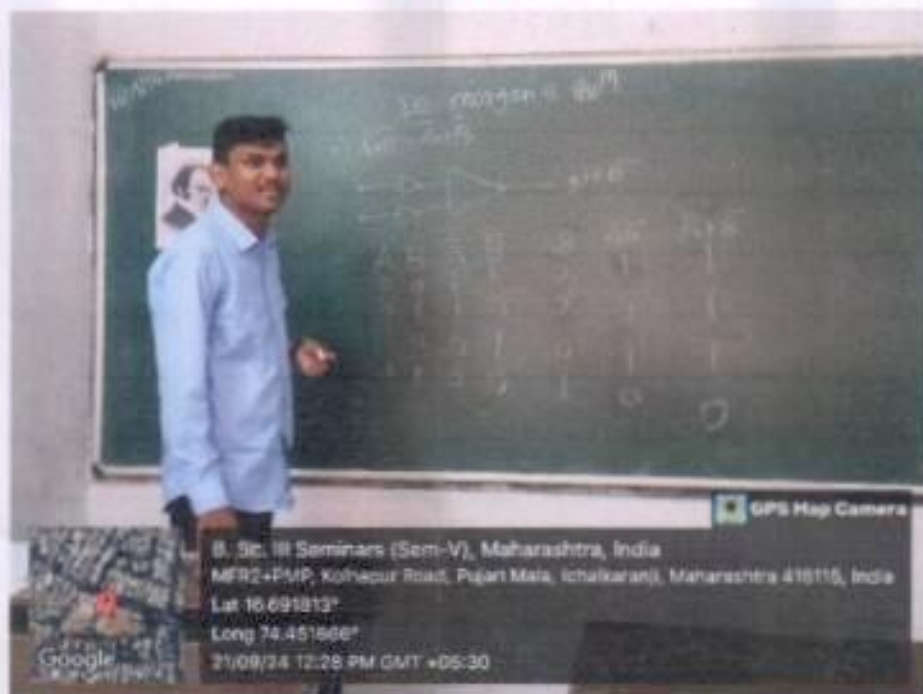


Miss Anushka Desai delivering an engaging seminar on
"Physically Acceptable Wavefunctions"



HEAD
Department of Physics
Pujari Mala, Ichalkaranj
21/09/24

Mr. Omkar Khot presenting a seminar on "De-Morgans Theorems"



Miss. Kulsum presented a seminar on "Conservation of linear momentum and energy"



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

DEPARTMENT OF PHYSICS

SEMESTER REPORT (SEMESTER - V)

Name: Miss. Madhura Prasad Ranade

Class: B.Sc. III

Roll no.: 7072

Seminar Subject: Solution for Second Order Homogenous Linear
Differential Equations

Subject Teacher: Miss V. S. Dhobale



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Subject Teacher

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Examiner

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

'Solution for Second Order Homogeneous Linear Differential Equation with Constant Coefficient having Real Roots.'

The differential equation is said to be linear if the dependent variable and all its derivatives occur in the first power (without a product of dependent variable and a derivative).

If the RHS of these equations are zero then the corresponding differential equations are said to be Homogeneous Differential Equations.

e.g. $\frac{d^2y}{dx^2} + P(x)y = 0$

Here, $\frac{d^2y}{dx^2} + p(x) \frac{dy}{dx} + q(x) \cdot y = 0$

This is the general form of 2nd Order Homogeneous Differential Equations.

This equation with constant coefficient may be put in the form,

$$\frac{d^2y}{dx^2} + A \frac{dy}{dx} + By = 0 \quad \text{--- (1)}$$

Here A and B are constants

If $D = \frac{d}{dx}$ is linear operator then $\frac{d^2}{dx^2} = D^2$

$\therefore$ General solution of equation (1) is linear combination of independent solutions y_1 and y_2

$$y = y_1 + y_2$$

$$y = c_1 e^{ax} + c_2 e^{bx} \quad \text{--- (4)}$$

where, c_1 and c_2 are 2 arbitrary constants.

Case II: The roots are real and equal
i.e. ($a=b$)

Now the equation (2) can be written as

$$(D-a)(D-a)y = 0 \quad \text{--- (5)}$$

One of the solution of equation (5) is that of equation

$$(D-a)y = 0$$

i.e.

$$y_1 = c_3 e^{ax}$$

To obtain linearly independent 2nd solution let us put

$$x = (D-a)y \quad \text{--- (6)}$$

where A' and B' are arbitrary constant to be determined by initial condition of the problem

Example:

$$1. \frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = 0$$

→ The given equation is $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = 0$ — (1)

Using operator $D = \frac{d}{dx}$

∴ equation (1) becomes

$$(D^2 - 4D + 4)y = 0$$

Auxiliary equation : $D^2 - 4D + 4 = 0$

$$\therefore (D - 2)^2 = 0$$

$$D - 2 = 0 \quad \text{and} \quad D - 2 = 0$$

∴ Roots are $D = 2, 2$

$$\text{or } D = \frac{+4 \pm \sqrt{16 - 4 \times 4}}{2}$$

$$\dots \left\{ \text{by } D = \frac{-A \pm \sqrt{A^2 - 4B}}{2} \right\}$$

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**DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE
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DEPARTMENT OF PHYSICS

SEMESTER REPORT (SEMESTER - V)

Name: Miss. Anushka Gunaji Desai

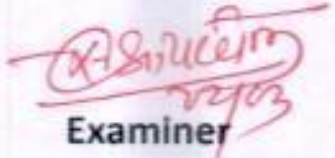
Class: B.Sc. III

Roll no.: 7066

Seminar Subject: Physical Acceptable Wave Function

Subject Teacher: Dr. V. S. Pawar


Subject Teacher


Examiner


Head of Department

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

Seminar

Defination of wavefunction (ψ)

A wave function denoted by " ψ " is a mathematical description of "quantum state of a system".

A quantum state means properties of system such as position, momentum and energy.

Wave function help to predict probabilities of finding a particle in a particular state.

Physical acceptable wave functions:

For a wave function to be physically acceptable it must satisfy following condition.

1) Single-valued :

ψ must be single valued in whole space.

Wave function $\psi(x, t)$ be single valued for all values of x and t .

The single value ensures unique quantum state

since,

$$P = \int \psi^* \psi d^3x$$

Probability must be one which is depend on value of ψ and ψ^* . so the value of ψ and ψ^*

and the derivative of wave function become infinite. hence when we use momentum operator for finding momentum it become infinite. And for any physical system momentum can't be infinite.

so the wave function must be continuous in whole space.

3. square integrable :

wave function must be square integrable.

square integrable means it should satisfy given condition.

$$\int \psi^* \psi d^3x = \int |\psi|^2 d^3x = \text{Finite}$$

Finite means its value should be between 0 to 1.

$$\int_{\text{all space}} |\psi|^2 d^3x = 1$$

This is an equation for finding particle in whole space.

This wave equation is also known as normalised wave function.

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Department of Physics

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

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	01	01	01	01	05
2	7065	Miss. CHIKORDE ADITI PRAVIN	01	02	02	01	01	07
3	7066	Miss. DESAI ANUSHKA GUNAJI	02	02	02	01	02	09
4	7067	Miss. KAMBLE TEJASWINI N	02	02	01	01	01	07
5	7068	Mr. KHOT OMKAR SUKUMAR	02	02	02	01	02	09
6	7069	Miss. MAGADUM DIPALI BAIASO	01	01	01	02	01	06
7	7070	Miss. MULLA KULSUM NAJIR	02	02	02	01	02	09
8	7071	Miss. NADUGIRE AMRUTA A	01	01	01	01	02	06
9	7072	Miss. RANADE MADHURA P	02	02	02	02	02	10
10	7073	Mr. RAVAL PAVAN GURUDEV	01	02	01	01	02	07
11	7095	Miss. SASANE PALLAVI SHIVAJI	01	02	01	01	02	07

Mr. S. D. Pathan

Dr. V. S. Pawar

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Ichalkaranji.



Department of Physics

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

Date: 18/09/2024

The Department of Physics organized seminars for B. Sc. III students during **Semester V** of the academic year **2024-2025**. A total of **11** students delivered presentations on topics of their choice, each lasting 30 minutes. All students selected unique topics and confidently presented lectures on subjects from the academic syllabus, such as **Classical Mechanics, Mathematical Physics, Digital Electronics, Quantum Mechanics, and Atoms, Molecules, and Astrophysics**. 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.


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