



Calculations in Physics Using Log Table

Sept-2022 to oct-2022

Number of students-35

“Permission Letter”

Date:24/08/2022

To,
The Principal,
Nutan Mahavidyalaya, Selu

Subject: Request for permission to organize a Certificate Course in “Calculations in Physics Using Log Table ”

Sir

I, Dr. B.K.Kumthekar , Head of the Department of Physics, request you to kindly grant me permission to organize a Certificate Course in for the academic year 2022-23. The course will be conducted from 1/09/2022 To 07/10/2022

The following are the details of the course:


Course Name:- Basic Instrument Handling in Physics Laboratory

Duration: 5 Weeks

Dates: 1/09/2022 To 07/10/2022 .

The course will be conducted by experienced faculty members from the Department of Physics of the college. The course will be beneficial for students who are interested in pursuing a career in Basic Science

I will be grateful if you permit me for the same


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Certificate Course In Physics

Academic Year-2022-23

NOTICE

All students of B.Sc. Physics are hereby informed that a certificate course on "Calculations in Physics Using Log Table" is scheduled from 1/09/2022 To 07/10/2022. Interested Students should register their name to Dr.B.K.Kumthekar before 27/08/2022

The Course mentioned above is scheduled as follows.

Date	Time	Course	Faculty	Room No.
1/09/2022 To 07/10/2022	2:00 to 2:50	Calculations in Physics Using Log Table	Dr.B.K.Kumthekar Mr.V.P.Patil	Physics Lab

Course Co-ordinator

Dr.B.K.Kumthekar

Principal

**I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani**

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Department Of Physics

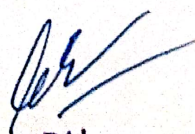
Inaugral Function Of

Certificate Course On "Calculations in Physics Using Log Table "

Academic Year-2022-23

Date:- 1/09/2022

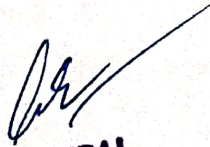
Introduction And Welcome	Dr.B.K.Kumthekar (Head Department Of Physics)
Introduction Of the Guest	Mr.V.P.Patil
Chief Guest	Dr.S.S.Kulkarni (Executive Member Of Nutan Vidyalaya Shikshan Sanstha's and Former Principal Of Nutan Mahavidyalaya,Selu)
President Of Programme	Dr.M.S.Shinde (I/C Principal, Nutan Mahavidyalaya,Selu)
Anchoring	Dakh Kalinda Govindrao
Vote Of Thanks	Dagdu Arthavi Vijay
Venue	Department Of Physics
Time	2:00 pm


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Students Participated In the Course:-

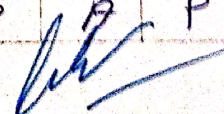
Sr.No.	Student Name	signature
1	Dakh Kalinda govindrao	Kalinda
2	Rakh Priyanka Dattarao	Rakh
3	Wanare Aishwarya Kailas	Aishwarya
4	Tathe Shubhangi Sharad	Shubhangi
5	Sonne Pooja Asaram	Pooja
6	Tale Pratima Pralhad	Pratima
7	Sawant Shraddha Nandkishor	Shraddha
8	Pachange Sujata Govind	Sujata
9	Rokde priyanka Vishvanath	Priyanka
10	Adabe Gitanjali Govindtrao	Gitanjali
11	Kakde Pushpa Kalyan	Pushpa
12	Tathe Tanuja Bhagirath	Tanuja
13	Saraf Yash Vinod	Yash
14	Aniket K.Thoke	Aniket
15	Magar Sanjog Anilrao	Sanjog
16	Jawale Shivkanya Shubhash	Shivkanya
17	Jadhav Asmita Sanjay	Asmita
18	Thorvate Vaibhav Prabhakar	Vaibhav
19	More Rushikesh Vinayak	Rushikesh
20	Ganeash Suryakant Tamkhane	Suryakant
21	Vavare Suresh Rambhau	Suresh
22	Salegaonkar Ronak Dattatray	Ronak
23	Bedarkar Abhishek Chandrakant	Abhishek
24	Phatke Sakshi Santosh	Sakshi
25	Sonwane Aishwarya Shivaji	Aishwarya
26	Rodge Vaishnavi Ramesh	Vaishnavi
27	Adne Vaishnavi Ramesh	Vaishnavi
28	Harkal Disha Dnyanoba	Disha
29	Gondhalkar Manjusha Dnyaneshwar	Manjusha
30	Navghare Pallavi Yadavrao	Pallavi
31	Khandare Pallavi Hanumant	Pallavi
32	Dagdu Arthavi Vijay	Arthavi
33	Dagdu Sapna Bhagwan	Sapna
34	Musale Nikita Madhavrao	Nikita
35	Ghodke Priyanka Rajendra	Priyanka


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Attendance Of Students:-

Sr. No	Student Name	01/9/22	02/9/22	03/9/22	05/9/22	06/9/22	07/9/22	08/9/22	09/9/22	10/9/22
1	Dakh Kalinda govindrao	P	P	P	P	P	P	P	P	P
2	Rakh Priyanka Dattarao	P	P	P	P	P	P	P	P	P
3	Wanare Aishwarya Kailas	P	P	P	P	A	P	P	P	P
4	Tathe Shubhangi Sharad	P	P	P	P	P	P	A	P	P
5	Sonne Pooja Asaram	P	P	P	P	P	P	P	P	P
6	Tale Pratima Pralhad	P	P	P	P	P	P	P	P	P
7	Sawant Shraddha Nandkishor	P	P	P	P	A	P	P	P	P
8	Pachange Sujata Govind	P	P	P	P	P	P	A	P	P
9	Rokde priyanka Vishvanath	P	P	P	P	P	P	P	P	P
10	Adabe Gitanjali Govindrao	P	P	P	P	P	P	P	P	A
11	Kakde Pushpa Kalyan	P	P	P	P	P	P	P	P	P
12	Tathe Tanuja Bhagirath	P	P	A	P	P	P	P	P	P
13	Saraf Yash Vinod	P	P	P	P	P	P	P	P	A
14	Aniket K.Thoke	P	P	P	P	P	P	P	P	P
15	Magar Sanjog Anilrao	P	P	P	P	P	A	P	A	P
16	Jawale Shivkanya Shubhash	P	P	P	P	P	P	P	P	P
17	Jadhav Asmita Sanjay	P	P	P	P	A	P	P	P	P
18	Thorvate Vaibhav Prabhakar	P	P	P	P	P	P	P	P	P
19	More Rushikesh Vinayak	P	P	P	P	P	P	P	A	P
20	Ganeash Suryakant Tamkhane	P	P	P	P	P	P	P	P	P
21	Vavare Suresh Rambhau	P	P	P	P	P	P	A	P	P
22	Salegaonkar Ronak Dattatray	P	P	P	P	P	P	P	A	P
23	Bedarkar Abhishek Chandrakant	P	P	P	P	P	P	P	P	P
24	Phatke Sakshi Santosh	P	P	P	P	P	A	P	P	P
25	Sonwane Aishwarya Shivaji	P	P	P	A	P	P	A	P	P
26	Rodge Vaishnavi Ramesh	P	P	P	P	P	P	P	P	A
27	Adne Vaishnavi	P	P	P	P	P	P	P	P	P



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	Ramesh									
28	Harkal Disha Dnyanoba	P	P	P	P	P	P	P	P	P
29	Gondhalkar Manjusha Dnyaneshwar	P	P	P	P	P	P	P	P	P
30	Nayghare Pallavi Yadavrao	P	P	P	A	P	P	P	P	P
31	Khandare Pallavi Hanumant	P	P	P	P	P	P	P	P	A
32	Dagdu Arthavi Vijay	P	P	P	P	P	P	A	P	P
33	Dagdu Sapna Bhagwan	P	P	P	P	P	P	P	P	P
34	Musale Nikita Madhavrao	P	P	P	P	A	P	P	P	P
35	Ghodke Priyanka Rajendra	P	P	P	P	P	P	P	P	P




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Sl. No	Student Name	12/0/22	13/0/22	14/0/22	15/0/22	16/0/22	17/0/22	18/0/22	19/0/22	20/0/22
1	Dakh Kalinda govindrao	P	P	P	P	P	P	P	P	P
2	Rakhi Priyanka Dattarao	P	P	P	P	P	P	P	P	P
3	Wanare Atshwarya Kailas	P	P	P	P	P	A	P	P	P
4	Lathe Shubhangi Shrad	P	P	P	P	P	P	P	P	P
5	Sone Pooja Antram	P	P	P	P	P	P	P	P	P
6	Tale Pratima Pralhad	P	P	P	P	A	P	P	P	P
7	Sawant Shraddha Nandkeshor	P	P	P	P	P	P	P	P	P
8	Pachange Sujata Govind	P	P	P	P	P	P	P	P	P
9	Rokde priyanka Vishvanath	P	P	P	P	P	P	A	P	P
10	Adabe Gitunjali Govindrao	P	P	P	P	P	P	P	A	P
11	Kakde Pushpa Kalyan	P	P	P	A	P	P	P	P	P
12	Lathe Tanuja Bhagirath	P	P	P	P	P	P	P	P	P
13	Satal Yash Vinod	P	P	P	P	P	P	P	P	P
14	Aniket K Thoke	P	P	A	P	P	P	P	P	P
15	Magar Sanjog Anilrao	P	P	P	P	P	P	P	P	P
16	Jawale Shivkanya Shubhash	P	P	P	P	P	P	P	P	P
17	Jadhav Asmita Sanjay	P	P	P	P	P	P	P	P	P
18	Thorvate Vaibhav Prabhakar	P	P	P	P	P	P	A	P	P
19	More Rushikesh Vmayak	P	P	P	P	P	P	P	P	P
20	Gancash Suryakant Tamkhane	P	P	P	P	P	P	P	P	A
21	Vavare Suresh Rambhau	P	P	P	P	A	P	P	P	P
22	Salegaonkar Ronak Dattatray	P	P	P	P	P	P	P	P	P
23	Bedarkar Abhishek Chandrakant	P	P	P	P	P	P	P	P	P
24	Phatke Sakshi Santosh	P	P	P	P	P	P	P	P	A
25	Sonwane Aishwarya Shivaji	P	P	A	P	P	P	P	A	P
26	Rodge Vaishnavi Ramesh	P	P	P	P	P	P	P	P	P
27	Adne Vaishnavi Ramesh	P	P	P	P	P	P	A	P	P
28	Harkal Disha Dnyanoba	P	P	P	P	P	P	A	P	P

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29	Gondhalkar Manjusha Dnyaneshwar	A	A	P	P	P	P	P	P	P
30	Navghare Pallavi Yadavrao	P	P	P	P	P	P	P	P	P
31	Khandare Pallavi Hanumant	P	P	P	P	P	P	P	P	A
32	Dagdu Arthavi Vijay	P	P	A	P	P	P	P	P	P
33	Dagdu Sapna Bhagwan	P	P	P	P	P	P	P	P	P
34	Musale Nikita Madhavrao	P	P	P	P	P	P	P	A	P
35	Ghodke Priyanka Rajendra	P	P	P	A	P	P	P	P	P

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Sr. No	Student Name	22/9/22	23/9/22	24/9/22	26/9/22	27/9/22	28/9/22	29/9/22	30/9/22	01/10/22
1	Dakh Kalinda govindrao	P	P	P	P	P	P	A	P	P
2	Rakh Priyanka Dattarao	P	P	P	P	P	P	P	P	P
3	Wanare Aishwarya Kailas	P	P	P	A	P	P	P	P	P
4	Tathe Shubhangi Sharad	P	P	P	P	P	P	P	P	P
5	Sonne Pooja Asaram	P	P	P	P	A	P	P	P	P
6	Tale Pratima Pralhad	P	P	P	P	P	P	P	P	P
7	Sawant Shraddha Nandkishor	P	P	P	P	P	P	P	P	A
8	Pachange Sujata Govind	P	P	P	P	P	P	P	P	P
9	Rokde priyanka Vishvanath	P	P	P	A	P	P	P	P	P
10	Adabe Gitanjali Govindtrao	P	P	P	P	P	P	P	P	P
11	Kakde Pushpa Kalyan	P	P	P	P	P	P	P	P	P
12	Tathe Tanuja Bhagirath	P	P	P	P	P	P	A	P	P
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26	Rodge Vaishnavi Ramesh	P	P	A	P	P	P	P	P	P
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28	Harkal Disha Dnyanoba	P	P	P	P	P	P	P	A	P


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29	Gondhalkar Manjusha Dnyaneshwar	P	P	P	P	P	P	A	P	P
30	Nayghare Pallavi Yadavrao	P	P	A	P	P	P	P	P	P
31	Khandare Pallavi Hanumant	P	P	P	P	P	A	P	P	P
32	Dagdu Arthavi Vijay	P	P	P	P	P	P	P	P	P
33	Dagdu Sapna Bhagwan	P	P	P	P	P	P	P	P	P
34	Musale Nikita Madhavrao	P	P	P	P	P	A	P	P	P
35	Ghodke Priyanka Rajendra	P	P	P	P	P	P	P	P	A


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Sr. No	Student Name	03/10/22	04/10/22	05/10/22	06/10/22	07/10/22
1	Dakh Kalinda govindrao	P	P	P	P	P
2	Rakh Priyanka Dattarao	P	P	A	P	P
3	Wanare Aishwarya Kailas	P	P	P	P	P
4	Tathe Shubhangi Sharad	P	P	P	P	P
5	Sonne Pooja Asaram	A	P	P	P	P
6	Tale Pratima Pralhad	P	P	P	P	P
7	Sawant Shraddha Nandkishor	P	P	P	P	P
8	Pachange Sujata Govind	P	P	P	P	A
9	Rokde priyanka Vishvanath	P	P	P	P	P
10	Adabe Gitanjali Govindtao	P	A	P	P	P
11	Kakde Pushpa Kalyan	P	P	P	P	P
12	Tathe Tanuja Bhagirath	P	P	P	P	P
13	Saraf Yash Vinod	P	P	P	P	P
14	Aniket K.Thoke	P	P	P	P	P
15	Magar Sanjog Anilrao	P	P	P	A	P
16	Jawale Shivkanya Shubhash	P	P	P	P	P
17	Jadhav Asmita Sanjay	P	P	P	P	P
18	Thorvate Vaibhav Prabhakar	P	P	A	P	P
19	More Rushikesh Vinayak	P	P	P	P	P
20	Ganeash Suryakant Tamkhane	P	P	P	P	P
21	Vavare Suresh Rambhau	P	P	P	A	P
22	Salegaonkar Ronak Dattatray	P	P	P	P	P
23	Bedarkar Abhishek Chandrakant	P	P	P	P	P
24	Phatke Sakshi Santosh	P	P	P	P	A
25	Sonwane Aishwarya Shivaji	P	P	A	P	P
26	Rodge Vaishnavi Ramesh	P	P	P	A	P
27	Adne Vaishnavi Ramesh	P	A	P	P	P
28	Harkal Disha Dnyanoba	P	P	P	P	P

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29	Gondhalkar Manjusha Dnyaneshwar	P	A	P	P	P
30	Navghare Pallavi Yadavrao	P	P	P	A	P
31	Khandare Pallavi Hanumant	P	P	P	P	P
32	Dagdu Arthavi Vijay	P	P	A	P	P
33	Dagdu Sapna Bhagwan	P	P	P	P	P
34	Musale Nikita Madhavrao	P	P	P	P	P
35	Ghodke Priyanka Rajendra	P	P	P	P	A


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Timetable:-

Sr. No	Date	Day	Time	Teacher's Name	Topic
1	01/09/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Introduction and Importance Of Log Table in Physics Practical
2	02/09/2022	Friday	2:00 to 2:50	Mr.V.P.Patil	Definition of logarithms
3	03/09/2022	Saturday	2:00 to 2:50	Dr.B.K.Kumthekar	Properties of logarithms (product rule, quotient rule, power rule)
4	05/09/2022	Monday	2:00 to 2:50	Mr.V.P.Patil	Natural logarithms (ln) and common logarithms (log base 10)
5	06/09/2022	Tuesday	2:00 to 2:50	Dr.B.K.Kumthekar	Exponential form and logarithmic form
6	07/09/2022	Wednesday	2:00 to 2:50	Mr.V.P.Patil	Applications of logarithms in Physics Practicals
7	08/09/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Understanding orders of magnitude
8	09/09/2022	Friday	2:00 to 2:50	Mr.V.P.Patil	Introduction to logarithm tables
9	10/09/2022	Saturday	2:00 to 2:50	Dr.B.K.Kumthekar	Structure and format of logarithm tables
10	12/09/2022	Monday	2:00 to 2:50	Mr.V.P.Patil	How to read values from a logarithm table
11	13/09/2022	Tuesday	2:00 to 2:50	Dr.B.K.Kumthekar	Logarithms of integers, decimals, and fractions
12	14/09/2022	Wednesday	2:00 to 2:50	Mr.V.P.Patil	Practical tips for using logarithm tables effectively
13	15/09/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Laws of logarithms (product law, quotient law, power law)
14	16/09/2022	Friday	2:00 to 2:50	Mr.V.P.Patil	Derivation and proofs of logarithmic laws
15	17/09/2022	Saturday	2:00 to 2:50	Dr.B.K.Kumthekar	Solving equations involving logarithms
16	19/09/2022	Monday	2:00 to 2:50	Mr.V.P.Patil	Identity property of logarithms
17	20/09/2022	Tuesday	2:00 to 2:50	Dr.B.K.Kumthekar	Change of base formula
18	21/09/2022	Wednesday	2:00 to 2:50	Mr.V.P.Patil	Antilogarithm
19	22/09/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Mantissa
20	23/09/2022	Friday	2:00 to	Mr.V.P.Patil	Characteristic

[Signature]
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			2:50		
21	24/09/2022	Saturday	2:00 to 2:50	Dr.B.K.Kumthekar	Sine Angles Calculations using Log Table
22	26/09/2022	Monday	2:00 to 2:50	Mr.V.P.Patil	Cosine Angles Calculations using Log Table
23	27/09/2022	Tuesday	2:00 to 2:50	Dr.B.K.Kumthekar	Tan Angles Calculations using Log Table
24	28/09/2022	Wednesday	2:00 to 2:50	Mr.V.P.Patil	Calculations of inverse Angles
25	29/09/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Practice Problems
26	30/09/2022	Friday	2:00 to 2:50	Mr.V.P.Patil	Taking square and square roots using log table
27	01/10/2022	Saturday	2:00 to 2:50	Dr.B.K.Kumthekar	Taking Cube roots Using Log Table
28	03/10/2022	Monday	2:00 to 2:50	Mr.V.P.Patil	Taking Inverse Using Log Table
29	04/10/2022	Tuesday	2:00 to 2:50	Dr.B.K.Kumthekar	Recap of logarithmic concepts covered so far
30	05/10/2022	Wednesday	2:00 to 2:50	Mr.V.P.Patil	Practice problems and discussions
31	06/10/2022	Thursday	2:00 to 2:50	Dr.B.K.Kumthekar	Addressing common challenges in using logarithms
32	07/10/2022	Friday	2:00 to 2:50	Mr.V.P.Patil	Tips for efficient problem-solving with logarithms in Physics Practical


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page No :
Date :

LOGARITHM

Def: if $m = a^x$ where $a > 0$ & $a \neq 1$, $m > 0$ then x is called the logarithm of m to the base a & this is written as $x = \log_a m$ where m, a, x are real numbers.

$m = a^x$ is called exponential form or index form & $x = \log_a m$ is called logarithmic form

Logarithms to the base 10 are called common or Briggs logarithms

Common Logarithms:

$$\text{As } 10^2 = 100$$

$$\therefore 2 = \log_{10}^{100}$$

In this case, we say that 2 is characteristic of logarithms.

$$10^3 = 1000$$

$$\therefore 3 = \log_{10}^{1000}$$

\therefore we say that \log_{10}^{300} lies between 2 & 3

$\therefore \log_{10}^{300}$ is of the form $2+k$ where k is fraction between 0 & 1

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The integral part to is called characteristics of logarithm & the fractional part k is called as Mantissa of the logarithm

$$\therefore \log_{10}^N = \text{characteristic} + \text{Mantissa}$$

iv) If the number $N \geq 1$ has m digit in its integral part, then subtract 1 from m , to find characteristic of \log_{10}^N

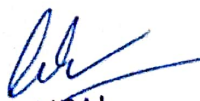
i.e. characteristic of $\log_{10}^N = m - 1$, where $N \geq 1$

	Number	characteristic
1)	68.45	1
2)	320.40	2
3)	8.715	0
4)	25789.24	4

$N < 1$

If there are ' p ' zeroes immediately after the decimal point, then characteristic is $-(p+1)$

i.e. characteristic of $\log_{10}^N = -(p+1)$ where $N < 1$


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The integral part to is called characteristics of logarithm & the fractional part k is called as Mantissa of the logarithm

$$\therefore \log_{10} N = \text{characteristic} + \text{Mantissa}$$

- 1) If the number $N \geq 1$ has m digit in its integral part, then subtract 1 from m , to find characteristic of $\log_{10} N$
i.e. characteristic of $\log_{10} N = m - 1$,
where $N \geq 1$

	Number	characteristic
1)	68.45	1
2)	320.40	2
3)	8.715	0
4)	25789.24	4

$N < 1$

If there are ' p ' zeroes immediately after the decimal point, then characteristic is $-(p+1)$

i.e. characteristic of $\log_{10} N = -(p+1)$
where $N < 1$

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In case of a number having more than 4 significant digit the fourth digit is rounded off with the help of the fifth digit

$$\text{ex: } \log 53.847 = \log 53.85$$

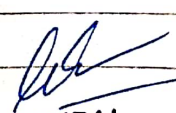
Number	Log: (characteristic Mantissa)
1) 16.08	1.2052
2) 3.142	0.4972
3) 2011	3.3034
4) 0	$\bar{2}.2918$

Antilogarithm

If $x = \log_a m$, then, $m = \text{antilog}_a x$

To find antilog with proced as follows:

- 1) Separate characteristic p & Mantissa q of the logarithm.
- 2) The antilog of mantissa q is found out from the antilog table.


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3) Let $p + 1 = m$

a) If m is positive then, place the decimal point after m digit.

b) If m is Negative then place the decimal point before m zeroes from the first digit.

c) If $m = 0$ then place the decimal point before first digit of antilog of Mantissa.

$$\text{ex: } \text{antilog}_{10}(2.9586) = 909.0$$

$$\text{antilog}_{10}(\bar{2}.2015) = 0.01591$$

$$\text{antilog}_{10}(T.8840) = 0.7656$$

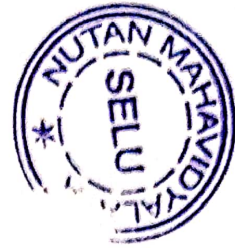
$$\text{antilog}_{10}(0.0930) = 1.239$$

$$\text{antilog}_{10}(3.9371) = 8652$$

$$\text{antilog}_{10}(\bar{5}.6118) = 0.00004091$$

$$\text{antilog}_{10}(0.8245) = 6.676$$

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Properties of logarithm:

$$1) \log(M \cdot N) = \log M + \log N$$

$$2) \log(M/N) = \log M - \log N$$

$$3) \log(N)^m = m \log N$$
$$\log \sqrt[m]{N} = \log N^{\frac{1}{m}} = \frac{1}{m} \log N$$

ex: find (1.252×16.07)

$$\text{Let } x = 1.252 \times 16.07$$

$$\therefore \log x = \log(1.252 \times 16.07)$$

$$= \log(1.252) + \log(16.07)$$

$$= 0.0976 + 1.2059$$

$$= 1.3035$$

$$\therefore x = \text{antilog}(1.3035)$$

$$= 2.011 \times 10^1$$

$$= 20.11$$

Find (851.9×11.82)

$$\text{Let } x = 851.9 \times 11.82$$

$$= \log(851.9 \times 11.82)$$

$$= \log(851.9) + \log(11.82)$$

$$= 2.9304 + 1.0727$$

$$\log x = 4.0031$$

$$\therefore x = \text{antilog}(4.0031)$$

$$= 1007$$


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Find (0.0642×3.142)

Number	Logarithm
0.0642	$\bar{2}.8075$
3.142	0.4972

Antilog $(1.3047) = 2017$
 $= 0.2017$

Find (24.55×80.3)


Number	Logarithm
24.55	1.3901
80.3	1.9047

Antilog $(3.2948) = 1972$
 $= 1972$

Find (0.03652×0.042)

Number	Logarithm
0.03652	$\bar{2}.5625$
0.042	$\bar{2}.6232$

Antilog $= \bar{3}.1857$
 $= 1533$
 $= .001533$


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$$\text{Find } \left(\frac{16.07}{1.252} \right)$$

Number	Logarithm
16.07	1.2059
1.252	0.0976

$$\text{Antilog } (1.1083) = 1283 \\ = 12.83$$

$$\text{Find } (34.63 \div 5.416)$$

Number	Logarithm
34.63	1.5395
5.416	0.7337

$$\text{Antilog } (0.8058) = 6395 \\ = 6.395$$

$$\text{Find } (99.97 \div 1001)$$

Number	Logarithm
99.97	1.9999
1001	3.0004

$$\text{Antilog } (2.9995) = 9988 \\ = 0.09988$$

$$\text{Find } (0.0452 \div 1.355)$$

Number	Logarithm
0.0452	2.6551
1.355	0.1319

$$\text{Antilog } (2.5232) = 3336 = 0.03336$$

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Find $(2.614)^3$

$$\text{Let } x = (2.614)^3$$

$$\log x = \log (2.614)^3$$

$$= 3 \times 0.4173$$

$$= 1.2519$$

$$\therefore x = \text{antilog} (1.2519)$$

$$= 1.786$$

$$= 17.86$$

Find $\sqrt[3]{27.85}$

$$\text{Let } x = \sqrt[3]{27.85}$$

$$= \log 27.85^{\frac{1}{3}}$$

$$= \frac{1}{3} \log 27.85$$

$$= \frac{1}{3} \times 1.4448$$

$$\therefore \log x = 0.4816$$

$$\therefore x = \text{antilog} (0.4816) = 3.031$$

Find $\sqrt[2]{43.17}$

$$\text{Let } x = \sqrt[2]{43.17}$$

$$\therefore \log x = \log 43.17^{\frac{1}{2}}$$

$$= \frac{1}{2} \log 43.17$$

$$= \frac{1}{2} \times 1.6352$$

$$= 0.8126$$

$$\therefore x = \text{antilog} (0.8126)$$

$$= 6.510$$

$$= 6.510$$

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Sine, Cosine & tangent

sine, cosine & tangents at angle θ are found using the tables of Natural sine, natural cosine & natural tangents.


plane angle is measured in degrees, where $1^\circ = 60'$, following a sexagesimal system (i.e. 1 part is divided into 60 parts). Hence in the above table, the column is for angle in degrees & the substituent column headings are in multiples of 6'

In the range 0° to 90° , sine & tangent of an angle θ increases as θ increases, so the mean difference is added as usual.

However, $\cos \theta$ decreases as θ increases, so the mean difference is subtracted.

$$\begin{aligned} \text{ex: } \sin 40^\circ 25' & \\ &= \sin 40^\circ 24' + 1' \\ &= 0.6481 + 0.0002 \\ &= 0.6483 \end{aligned}$$

$$\begin{aligned} \text{ex: } \cos 40^\circ 25' & \\ &= \cos 40^\circ 25' + 1' \\ &= 0.7615 - 0.0002 \\ &= 0.7613 \end{aligned}$$


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To find θ , where sine is known, work in reverse as following:

Given $\sin \theta = 0.6069$, locate this number or the just less this number in the table for the natural sine, which is 0.6060 in the row corresponding to 37° & under the column $18'$ the difference of 9 (or close to 9 as possible) in the last digit is found in the same row under the mean difference column heading $4'$

$$\begin{aligned}\text{Hence, } \theta &= 37^\circ 18' + 4' \\ &= 37^\circ 22'\end{aligned}$$

Given $\cos \theta = 0.6069$, locate this number or the one just greater than this number in the table for natural cosine which is 0.6074 in the row corresponding to 52° & under the column heading $36'$ under the difference of 5 (as close to 5 as possible) in the last digit is found in the same row under the mean difference column heading $2'$

$$\begin{aligned}\theta &= 52^\circ 36' + 2' \\ &= 52^\circ 38'\end{aligned}$$


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Q. Find the sine of the following angle.

1) $60^{\circ}36'$

$$\begin{aligned}\sin &= 60^{\circ}36' \\ &= 0.8712\end{aligned}$$

2) $24^{\circ}15'$

$$\begin{aligned}\sin &= 24^{\circ}12' + 3' \\ &= 0.4099 + 0.0008 \\ &= 0.4107\end{aligned}$$

3) $36^{\circ}3'$

$$\begin{aligned}\sin &= 36^{\circ}3' \\ &= 0.5878 + 0.0007 \\ &= 0.5885\end{aligned}$$

Q. Find the tangent of the following angle

1) $39^{\circ}24'$

$$= 0.8214$$

2) $50^{\circ}7'$

$$\begin{aligned}&= 1.1967 + 0.0007 \\ &= 1.1967\end{aligned}$$

3) $81^{\circ}24'$

$$= 6.6122$$

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Q Find the cosine of the following

1) 54.121

$= 0.5850$

2) $23^{\circ}25'$

$= 23^{\circ}24'11''$

$= 0.9178 \pm 0.0001$

$= 0.9177$

3) $10^{\circ}4'$

$= 0.9848 - 0.0002$

$= 0.9848$

Q Find the angle θ in the following cases

1) $\sin \theta = 0.1739$

$= 10^{\circ}0'1''$

$= 10^{\circ}1'$

2) $\tan \theta = 1.5826$

$= 1.5816$

$= 57^{\circ}42'41''$

$= 57^{\circ}43'$

3) $\cos \theta = 0.9390$

$= 0.9391$

$= 20^{\circ}6'41''$

$= 20^{\circ}7'$

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Reciprocal:

The reciprocal of number x (i.e. $\frac{1}{x}$ or x^{-1}) is found using the tables of reciprocal of four figure number like the tables of natural cosine. The mean difference is subtracted because $\frac{1}{x}$ decreases as x increases.

$$\text{ex: } \frac{1}{0.5147} = \frac{1}{5.147 \times 10^{-1}} = \frac{10}{5.147} = 0.1943 \times 10 = 1.943$$

$$\frac{1}{51.47} = \frac{1}{5.147 \times 10^1} = \frac{10^{-1}}{5.147} = 0.1943 \times 10^{-1} = 0.01943$$

$$\frac{1}{343.6} = \frac{1}{3.436 \times 10^2} = \frac{1}{0.2910 \times 10^2} = 10^{-2} \times 0.2910 = 0.002910$$

$$\frac{1}{0.0045} = \frac{1}{4.5 \times 10^{-3}} = \frac{10^3}{4.5} = \frac{10^3}{0.2222} = 10^3 \times 0.2222 = 222.2$$

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Squares & Square Roots

$$\begin{aligned} \text{ex: } & \sqrt{196} \\ & = \sqrt{1.96 \times 10^2} \\ & = \sqrt{\quad} \\ & = 1.400 \times 10 \\ & = 1.4 \times 10 \\ & = 14.00 \end{aligned}$$

$$\begin{aligned} \text{ex: } & \sqrt{1470000} \\ & = \sqrt{1.470000 \times 10^6} \\ & = 1.212 \times 10^3 \\ & = 1212 \end{aligned}$$

$$\begin{aligned} \text{ex: } & \sqrt{1856} \\ & = \sqrt{18.56 \times 10^2} \\ & = \sqrt{4.308 \times 10} \\ & = 43.08 \end{aligned}$$


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Reference Books:-

Logarithmic Table, By George Willium Jones

Logarithmic and Other Mathematical Tables, By Simon Newcomb


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Department Of Physics

Academic Year-2022-23

Certificate Course On "Calculations in Physics Using Log Table"

Q. Solve the following multiple choice questions.

1) What is the logarithm base 10 of 100?

- A) 1
- B) 2
- C) 3
- D) 4

2) If $\log(2) = 0.3010$, what is $\log(20)$?

- A) 0.3010
- B) 1.3010
- C) 2.3010
- D) 3.3010

3) What is the antilogarithm of 2.4771?

- A) 304
- B) 294
- C) 254
- D) 284


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4) If $\log(x) = 1.69897$, what is x ?

- A) 30
- B) 47
- C) 49
- D) 50

5) The logarithm base 10 of 1000 is:


- A) 1
- B) 2
- C) 3
- D) 4

6) What is the value of $\log(4) + \log(25)$?

- A) 0.6021
- B) 0.9031
- C) 1.3010
- D) 1.6021

7) If $\log(3) = 0.4771$, what is $\log(9)$?

- A) 1.3010
- B) 0.9542
- C) 1.4771
- D) 0.6021


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8) If $\log(x) = 2.69897$, what is x ?


- A) 485
- B) 545
- C) 575
- D) 635

9) The antilogarithm of 2 is:

- A) 100
- B) 200
- C) 300
- D) 400

10) If $\log(8) = 0.9031$, what is $\log(64)$?

- A) 1.4771
- B) 1.6021
- C) 1.9031
- D) 2.0792


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Department Of Physics

Academic Year-2022-23

Certificate Course On "Calculations in Physics Using Log Table "

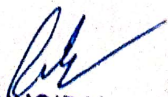
Q. Solve the following numerical using log Table.

- 1) A radioactive substance decays by 20% every 100 days. If the initial mass is 500 grams, calculate the mass remaining after 400 days.
- 2) The intensity of sound decreases by 6 dB when the distance from the source is doubled. If the initial intensity is 80 dB at a distance of 4 meters, find the intensity at a distance of 16 meters.
- 3) A capacitor discharges through a resistor in an RC circuit. If the initial charge on the capacitor is $200 \mu\text{C}$ and the time constant of the circuit is 0.1 seconds, calculate the charge remaining after 1 second.
- 4) The population of bacteria doubles every 3 hours. If there are initially 100 bacteria, determine the population after 9 hours.
- 5) A sample of a radioactive substance has a half-life of 20 days. If the initial activity is 400 disintegrations per second, find the activity after 60 days.
- 6) A light source emits 1000 photons per second. If the intensity decreases by 50% for every doubling of the distance from the source, calculate the number of photons per second at a distance of 4 meters from the source.
- 7) The resistance of a wire is directly proportional to its length and inversely proportional to its cross-sectional area. If a wire of length 10 meters and cross-sectional area 2 mm^2 has a resistance of 5 ohms, find the resistance of a wire of the same material with a length of 20 meters and a cross-sectional area of 4 mm^2 .
- 8) Find the half-life of a radioactive substance if its decay constant is 0.015 per year.
- 9) Find the energy emitted by a blackbody at a temperature of 5000 K, assuming its emissivity is 0.8, and its surface area 2 square meter.


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10) Calculate the velocity of a particle undergoing uniform circular motion with a radius of 0.1 meters and a period of 2 seconds.


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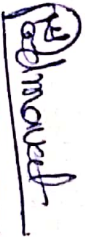
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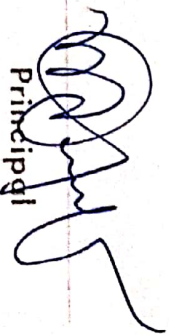


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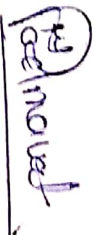
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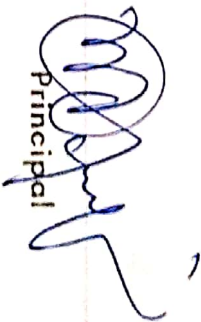

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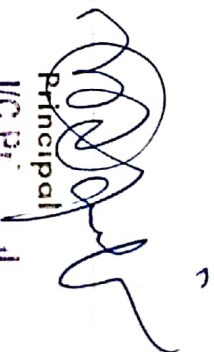


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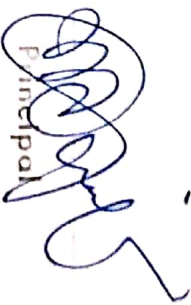
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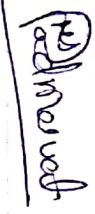

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Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)

IQAC
Director
IQAC

Nutan Mahavidyalaya, Selu

Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE OF COMPLETION



This is to be certified that

.....*Ms. Mangar Sanjay A.*.....

has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of.....*PHYSICS*.....from *4/9/22* to *7/10/22* with O/A/B/C/D grade.

[Signature]
PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

[Signature]

Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)

[Signature]

IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu

[Signature]

Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



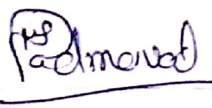
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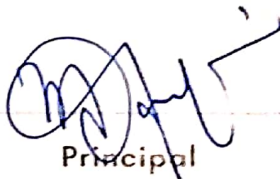
..... Ms. Jawale shirkanya S.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 4/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani


**Coordinator certificate
course**
Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)


**IQAC
Director
IQAC**
Nutan Mahavidyalaya, Selu


Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

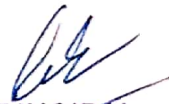
OF COMPLETION



This is to be certified that

...Ms. Jadhav Asmita S......

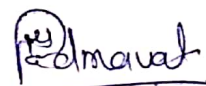
has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of.....PHYSICS.....from 4/9/22 to 7/12/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



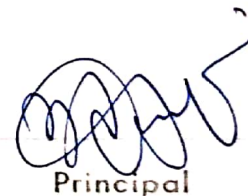
Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu



I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

.....*Mrs. Tharavate Vaibhav P.*.....

has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of.....*PHYSICS*.....from *1/10/22* to *7/10/22* with *O/A/B/C/D* grade.

[Signature]
PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

[Signature]
Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)

[Signature]
IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu

[Signature]
Principal
IC Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani




NUTAN MAHAVIDYALAYA SELU
CERTIFICATE
 OF COMPLETION

This is to be certified that

..... Mr. Mose Rushikesh V.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
 of PHYSICS from 19/22 to 30/22 with A/B/C/D grade.


 PRINCIPAL
 Nutan Mahavidyalaya
 SELU, Dist. Parbhani

Coordinator certificate
 course



Co-Ordinator
 Nutan Mahavidyalaya, Selu (MS)

IOAC



Director
 ICAC
 Nutan Mahavidyalaya, Selu



I/C Principal
 Nutan Mahavidyalaya
 Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

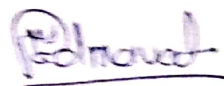
..... Mr. Ganesh S. Tamkhare

has successfully completed certificate course entitled as
Calculus Using Log Table conducted by Department
of PHYSICS from 4/0/22 to 21/0/22 with O/A/B/C/D grade.

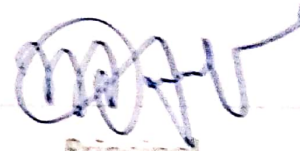

PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC
Director
Nutan Mahavidyalaya, Selu



IC Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

..... Mr. Varde Suresh R.

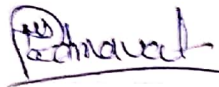
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 11/1/22 to 31/12/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

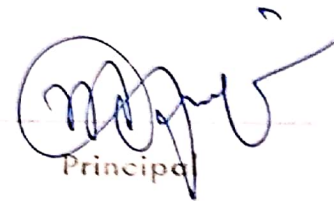


Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IOAC
Director
IQAC
Nutan Mahavidyalaya, Selu



IIC Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU


CERTIFICATE OF COMPLETION



This is to be certified that

..... Mr. Sadegamkar Rohak P.

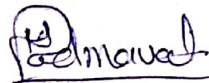
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 10/22 to 7/11/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



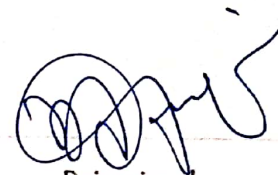
Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu



Principal

I/C Principal
Nutan Mahavidyalaya
Selu, Dist. Parbhani





NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

..... Mr. Bedarkar Abhishek C.

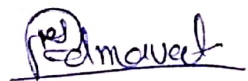
has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of.....PHYSICS.....from 1/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu



I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION





This is to be certified that

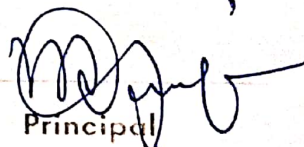
.....ms. Phatke Sakshi S.

has successfully completed certificate course entitled as
Calculations Using Log Table...conducted by Department
of.....PHYSICS.....from 11/9/22 to 31/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani


Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)


IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu


Principal
I/C Principal
Nutan Mahavidyalaya
Selu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

..... Ms. Sanwaha Aishwarya S.

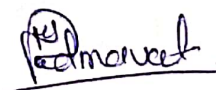
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 10/12 to 21/12 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



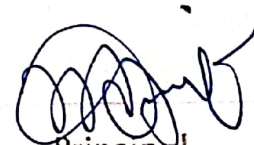
Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu

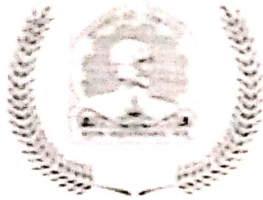


I/C Principal
Nutan Mahavidyalaya
Selu, Dist. Parbhani





NUTAN MAHAVIDYALAYA SELU




CERTIFICATE

OF COMPLETION

This is to be certified that

..... Ms. Rodge Vaishnavi R.

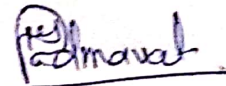
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



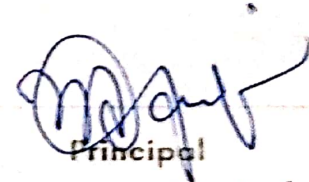
Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC
Director
IQAC

Nutan Mahavidyalaya, Selu



Principal
I/C Principal
Nutan Mahavidyalaya
Sallu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

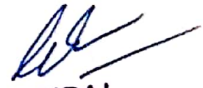
OF COMPLETION



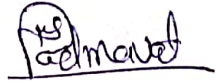
This is to be certified that


..... Ms. Adne Vaishnavi R.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 31/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani


Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)


IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu


Principal
IIC Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

Ms. Dakh Kalinda G.

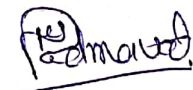
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 7/11/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



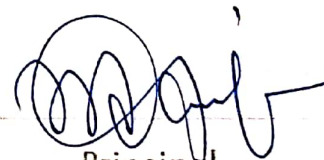
Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu



Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani

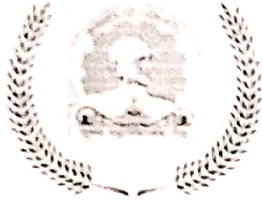




NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

..Ms. Rakh Baiyanka D.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 7/11/22 with O/A/B/C/D grade.

PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)

IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu

Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

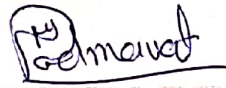
... Ms. Wangare Aishwarya K.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 01/09/22 to 7/10/22 with O/A/B/C/D grade.

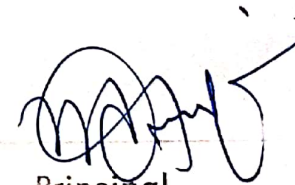

PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



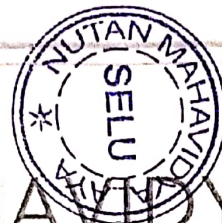
Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)



IOAC
Director
IQAC
Nutan Mahavidyalaya, Selu



Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

.....ms. Tathe Shubhangi S.

has successfully completed certificate course entitled as
calculations Using Log Table...conducted by Department
of.....PHYSICS.....from 1/9/22 to 7/10/22 with O/A/B/C/D grade.

PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)

IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu

Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani





NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

Ms. Sonne Pooja A.

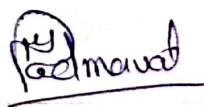
has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC

Director
IQAC
Nutan Mahavidyalaya, Selu



Principal

I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani





NUTAN MAHAVIDYALAYA SELU

CERTIFICATE

OF COMPLETION



This is to be certified that

Ms. Tale Pratima P.

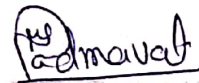
has successfully completed certificate course entitled as
Calculations Using Log Table...conducted by Department
of PHYSICS from 1/9/22 to 7/11/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

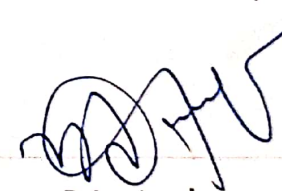


Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)



IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu



Principal
IIC Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani





NUTAN MAHAVIDYALAYA SELU


CERTIFICATE OF COMPLETION



This is to be certified that

.....ms. Sawant Shraddha N.

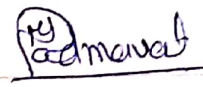
has successfully completed certificate course entitled as
Calculations (Using Log Table) conducted by Department
of.....PHYSICS.....from 1/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani



Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu (MS)



IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu



Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION

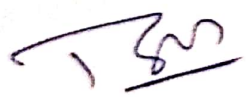


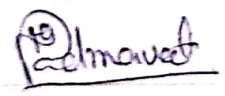
This is to be certified that

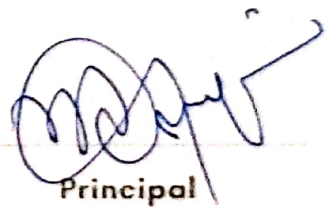
...ms. Pachange Sujata G.

has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of PHYSICS from 4/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani


Coordinator certificate
course
Co-Ordinator
Nutan Mahavidyalaya Selu (MS)


IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu


Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani



NUTAN MAHAVIDYALAYA SELU

CERTIFICATE


OF COMPLETION



This is to be certified that

... Ms. Rakde Bijanka V.

has successfully completed certificate course entitled as
Calculations Using Log Table conducted by Department
of PHYSICS from 1/9/22 to 7/1/22 with U/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani

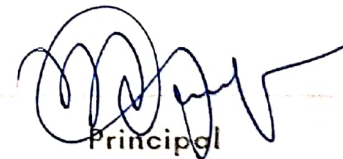


Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)



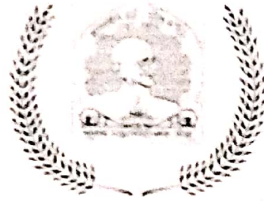
**IQAC
Director**
Nutan Mahavidyalaya, Selu



I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani

NUTAN MAHAVIDYALAYA SELU


CERTIFICATE
OF COMPLETION



This is to be certified that

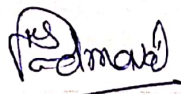
...ms. Adabe Gitanjali G.


has successfully completed certificate course entitled as
Calculations Using Log Table.....conducted by Department
of.....PHYSICS.....from 1/9/22 to 7/10/22 with O/A/B/C/D grade.


PRINCIPAL
Nutan Mahavidyalaya
SELU, Dist. Parbhani


Coordinator certificate
course

Co-Ordinator
Nutan Mahavidyalaya, Selu(MS)


IQAC
Director
IQAC
Nutan Mahavidyalaya, Selu


Principal
I/C Principal
Nutan Mahavidyalaya
Sailu, Dist. Parbhani