



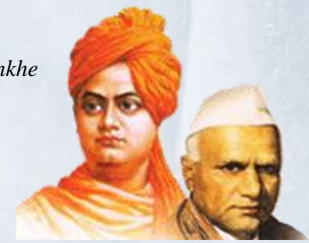
“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Autonomous).



Department of Physics
Value Added Course
on

Basic Instrumentation in Physics

1st August 2019

to

30 October 2019

Course Duration : 3 Months

Course Coordinator

Dr. G. J. Navathe

Head

Dr. M. M. Karanjkar

Principal

Dr. S. Y. Hongekar

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College (Autonomous), Kolhapur.
Department of Physics (2019-2020)

Syllabus for Add On Course
(Basic Instrumentation Course)

Unit: I

Thin Film Deposition Techniques:

1. Spray Pyrolysis Technique
2. Chemical bath depositions Technique
3. Silar Technique
4. Hydro thermal Technique
5. Electro deposition Technique
6. Reflux deposition Technique

Unit: II

Thin film Structural and morphological Characterization Techniques:

1. X-ray Diffraction Technique
2. Scanning electron Microscopic Technique
3. Raman Spectroscopic Technique
4. Infra red Spectroscopic Technique
5. UV Visible Spectroscopic Technique
6. Contact Angle

Unit: III

Thin film Electrochemical and Magnetic Characterization Techniques:

1. Cyclic voltammetry Technique
2. Charge Discharge Technique
3. Electro chemical impedance spectroscopy Technique
4. Vibrating Sample magnetometer

Unit: IV

Field Visit



"Education for Knowledge, Science and Culture"
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Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College (Autonomous), Kolhapur.
Basic Instrumentation Course in Physics
2019-2020

Name List

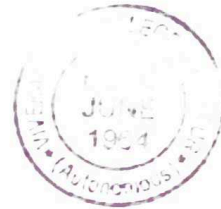
Sr. No.	Name of the student	Roll no.	Mobile No.
1	Mr. Bote Sushant Suresh		9765678141
2	Miss. Deshmukhe Aishwarya D		7620555104
3	Mr. Deshmukh Mahesh Bhauso		9503031726
4	Mr. Jadhav Amit Ashok		7768929719
5	Mr. Jadhav Shivprasad Krishnarao		9511618281
6	Miss. Kadam Ketaki Vasnat		8484090476
7	Miss Kamble Susmita Chandar		7721003292
8	Miss Mandavkar Ruchita Rajendra		9168520488
9	Miss Nirmale Pooja Ashok		9922709917
10	Mr. Patil Ashutosh Madukar		9158150190
11	Miss Patil Asmita Anandrao		7745820722
12	Miss Patil Manisha Nanaso		9665954375
13	Mr. Patil Pranit Mohanrao		7038565754
14	Miss Patil Swati Dinkar		8484885241
15	Miss Patole Anuradha L.		9881994004
16	Miss Phadatare Dhanashri Rajesh		9112691249
17	Mr. Sheralal Dinesh Naresh		7057865718
18	Miss Shinde Amruta Anandrao		9067962233
19	Mr. Tamboli Asif Jahangir		7972744863
20	Miss Tamke Vaishanavi Namdeo		7355990805
21	Mr. Bandgar Vishwambar Subhash		9145026690
22	Miss. Chavan Jayashri Madhukar		9657891961
23	Miss. Digraje Ankita Ravindra		8308480080
24	Mr. Gadekar Mahesh Madhav		9767266388
25	Miss. Jadhav Arati Kumar		9370724747
26	Miss. Jadhav Dhanashri Chandrakant		7798396480
27	Miss. Jadhav Pooja Sadanand		9730694160
28	Miss. Kadam Priyanka Jitendra		7745040142
29	Mr. Kesarkar Vinayak Baburao		7972382734
30	Miss. Kumbhar Shraddha Sanjay		9623809031
31	Miss. Mudhale Mayuri Ashok		8830884424
32	Miss. Nadaf Anisa Ajij		9665486019
33	Miss. Patil Priyanka Gundoji		7350527536
34	Miss. Patil Sayali Jayasing		9325172487



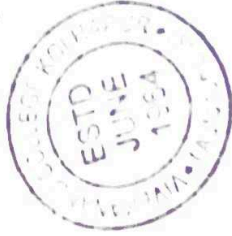
35	Miss. Patil Shital Vilas		9766551479
36	Miss. Patil Shivani Prakash		7058059753
37	Miss. Patil Snehal Sanjay		9689940665
38	Miss. Salunkhe Samruddhi Shrikant		9545614736
39	Miss. Desai shivani Suryakant		8329143636
40	Miss. Tivale Seema Rajesh		9765261113

G. Navathe
Coordinator

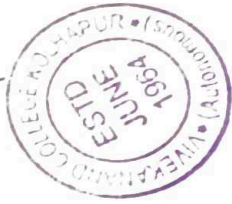
Dr. G. J Navathe
Add On Course
Department of Physics



Sr No	Name of the student	23/8	24/8	30/8	21/8	6/9	7/9	13/9	14/9	20/9	21/9	27/9	28/9	1/10	7/10	11/10
29	Mr. Kesarkar Vinayak Baburao	✓	A	A	A	PK	PK	PK	PK	PK	A	A	A	A	A	A
30	Miss. Kumbhar Shraddha Sanjay	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
31	Miss. Mudhale Mayuri Ashok	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
32	Miss. Nadaf Anisa Aijij	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
33	Miss. Patil Priyanka Gundoji	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
34	Miss. Patil Sayali Jayasing	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
35	Miss. Patil Shital Vilas	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
36	Miss. Patil Shivani Prakash	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
37	Miss. Patil Snehal Sanjay	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha	Sneha
38	Miss. Salunkhe Samruddhi Shrikant	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal	Sal
39	Miss. Desai shivani Suryakant	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai	Desai
40	Miss. Tivale Seema Rajesh	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale	Tivale
	Mr. Abhijeet V. Shinde	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet	Abhijeet
	Mr. I. M. Mulla	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.	I. M.



Sr No	Name of the student	19/8	20/8	26/8	27/8	3/9	9/9	16/9	17/9	23/9	24/9	30/9	1/10	7/10	14/10	15/10
29	Mr. Kesarkar Vinayak Baburao	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
30	Miss. Kumbhar Shraddha Sanjay	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
31	Miss. Mudhale Mayuri Ashok	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
32	Miss. Nadaf Anisa Aji	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
33	Miss. Patil Priyanka Gundooji	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
34	Miss. Patil Sayali Jayasing	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
35	Miss. Patil Shital Vilas	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
36	Miss. Patil Shivani Prakash	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
37	Miss. Patil Snehal Sanjay	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
38	Miss. Salunkhe Samruddhi Shrikant	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
39	Miss. Desai Shivani Suryakant	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
40	Miss. Tivale Seema Rajesh	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
	Mr. Abhijeet V. Shinde	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil
	Mr. I. M. Mulla	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil	Patil



Seat No. _____

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe
Shri Swami Vivekanand Shikshan Sanstha, Kolhapur
Vivekanand College, Kolhapur (Autonomous)
Department of Physics
Add On Course Examination
Basic Instrumentation course in physics

Date: 4/02/2020

Total Marks: 20

Time: 10.30 am to 11.30 am

Student's Name :

Student's Sign :

Jr. Supervisor Sign:

Q.1) Select correct alternative

(20)

- 1) Least count of Vernier caliper
- a) 0.001cm b) 0.01cm c) 0.0001cm d) 1cm
- 2) Pitch of micrometer screw gauge is defined as
- a) least count b) smallest division on micrometer scale
c) smallest division on main scale d) none of these
- 3) 100cm =mm
- a) 10 b) 1000 c) 100000 d) 1×10^4
- 4) The image formed by travelling microscope is
- a) horizontal b) inverted c) vertical d) tilted by 45°
- 5) The angles of biprism are⁰
- a) 60-60-60 b) 45-45-90 c) 179-0.5-0.5 d) 60-30-90
- 6) Condition for constructive interference is
- a) $n\lambda$ b) $(n+1)\frac{\lambda}{2}$ c) $(n-1)\frac{\lambda}{2}$ d) $(2n-1)\frac{\lambda}{2}$
- 7) In Fresnel's biprism experiment, wavelength of given monochromatic light is given by
- a) $\lambda = \frac{xd}{D}$ b) $\lambda = \frac{D}{xd}$ c) $\lambda = \frac{-xD}{d}$ d) $\lambda = \frac{D}{xD}$
- 8) Unit of figure merit of ballistic galvanometer is
- a) $\mu\text{m/A}$ b) $\mu\text{A/mV}$ c) $\text{A}/\mu\text{m}$ d) V
- 9) Ballistic galvanometer is
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c) Tangent galvanometer d) Moving coil Galvanometer



- 10) Voltmeter can be formed by connecting resistance in with galvanometer.
 a) parallel b) series c) vertically d) both in series and parallel
- 11) Current meter can be formed by connecting resistance in with galvanometer.
 a) parallel b) series c) vertically d) both in series and parallel
- 12) In ballistic galvanometer, copper wire is suspended between electromagnet by thread.
 a) Phosphor Bronze b) copper c) iron d) steel
- 13) Sextant instrument can be used to measure
 a) Current b) acceleration due to gravity
 c) Moment of inertia d) height of building
- 14) $1\text{nm} = \dots\dots\dots\text{m}$
 a) 10^{-9} b) 10^{-11} c) 10^{-6} d) 10^{-8}
- 15) Wavelength of sodium source
 a) $\lambda = 5896 \text{ \AA}$ b) 6896 \AA c) 7896 \AA d) 8896 \AA
- 16) In optical spectrometer, $1^\circ = \dots\dots\dots\text{min.}$
 a) 30 b) 60 c) 45 d) 90
- 17.) Diameter of capillary tube is measured using
 a) meter scale b) Vernier Caliper
 c) Micrometer screw gauge d) Travelling Micrometer
18. Current sensitivity of ballistic galvanometer is define as.....
 a) current in micro ampere required to consume one millimeter deflection on a scale
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 d) Both (a) and (b)
- 19) Color code for resistance $1500 \pm 10\%$ is
 a) Brown Brown Orange Silver b) Red Green Orange Silver
 c) Brown Red Orange Silver d) Brown Green Red Silver
- 20) Color code "Yellow Violet Orange Gold" is for resistance
 a) $15\text{K} \pm 5\%$ b) $33\text{K} \pm 5\%$ c) $47\text{K} \pm 5\%$ d) $15\text{K} \pm 10\%$



18
20

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Vivekanand College, Kolhapur (Autonomous)
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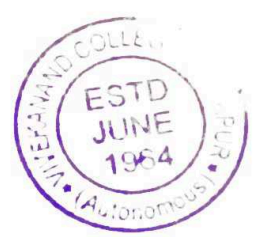
Student's Name : Shraddha Dinkar Jadhav

Student's Sign : [Signature]

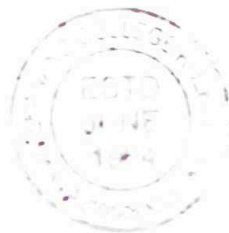
Jr. Supervisor Sign: _____

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20
20

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Vivekanand College, Kolhapur (Autonomous)
Department of Physics
Add On Course Examination
Basic Instrumentation course in physics

Date: 4/02/2020

Total Marks: 20

Time: 10.30 am to 11.30 am

Student's Name : Ragini Jay.prakash Benake

Student's Sign : Benake

Jr. Supervisor Sign: _____

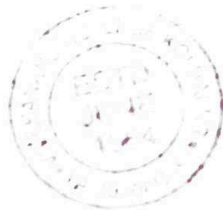
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19
20

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Add On Course Examination
Basic Instrumentation course in physics

Date: 4/02/2020

Total Marks: 20

Time: 10.30 am to 11.30 am

Student's Name : Samuddhi Gunda Magdum.....

Student's Sign : Magdum.....

Jr. Supervisor Sign:

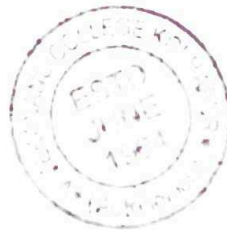
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 c) Micrometer screw gauge d) Travelling Micrometer
18. Current sensitivity of ballistic galvanometer is define as.....
 a) current in micro ampere required to consume one millimeter deflection on a scale
 b) voltage in micro ampere required to consume one millimeter deflection on a scale
 c) time required to consume one millimeter deflection on a scale
 d) Both (a) and (b)
- 19) Color code for resistance $1500 \pm 10\%$ is
 a) Brown Brown Orange Silver b) Red Green Orange Silver
 c) Brown Red Orange Silver d) Brown Green Red Silver
- 20) Color code "Yellow Violet Orange Gold" is for resistance
 a) $15\text{K} \pm 5\%$ b) $33\text{K} \pm 5\%$ c) $47\text{K} \pm 5\%$ d) $15\text{K} \pm 10\%$



20
20

Seat No. _____

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe
Shri Swami Vivekanand Shikshan Sanstha, Kolhapur
Vivekanand College, Kolhapur (Autonomous)
Department of Physics
Add On Course Examination
Basic Instrumentation course in physics

Date: 4/02/2020

Total Marks: 20

Time: 10.30 am to 11.30 am

Student's Name : Souabh Mahadev Kadam

Student's Sign : Kadam

Jr. Supervisor Sign: _____

Q.1) Select correct alternative

(20)

1) Least count of Vernier caliper

- a) 0.001cm b) 0.01cm c) 0.0001cm d) 1cm

2) Pitch of micrometer screw gauge is defined as

- a) least count b) smallest division on micrometer scale
c) smallest division on main scale d) none of these

3) 100cm =mm

- a) 10 b) 1000 c) 100000 d) 1×10^4

4) The image formed by travelling microscope is

- a) horizontal b) inverted c) vertical d) tilted by 45°

5) The angles of biprism are $^\circ$

- a) 60-60-60 b) 45-45-90 c) 179-0.5-0.5 d) 60-30-90

6) Condition for constructive interference is

- a) $n\lambda$ b) $(n+1)\frac{\lambda}{2}$ c) $(n-1)\frac{\lambda}{2}$ d) $(2n-1)\frac{\lambda}{2}$

7) In Fresnel's biprism experiment, wavelength of given monochromatic light is given by

- a) $\lambda = \frac{xD}{D}$ b) $\lambda = \frac{D}{xD}$ c) $\lambda = \frac{-xD}{d}$ d) $\lambda = \frac{D}{xD}$

8) Unit of figure merit of ballistic galvanometer is

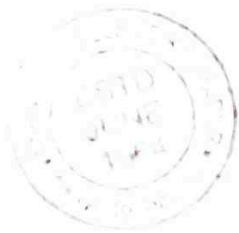
- a) $\mu\text{m}/\text{A}$ b) $\mu\text{A}/\text{mV}$ c) $\text{A}/\mu\text{m}$ d) V

9) Ballistic galvanometer is

- a) Astatic galvanometer b) Dead beat Galvanometer
c) Tangent galvanometer d) Moving coil Galvanometer



- 10) Voltmeter can be formed by connecting resistance in with galvanometer.
 a) parallel b) series c) vertically d) both in series and parallel
- 11) Current meter can be formed by connecting resistance in with galvanometer.
 a) parallel b) series c) vertically d) both in series and parallel
- 12) In ballistic galvanometer, copper wire is suspended between electromagnet by thread.
 a) Phosphor Bronze b) copper c) iron d) steel
- 13) Sextant instrument can be used to measure
 a) Current b) acceleration due to gravity
 c) Moment of inertia d) height of building
- 14) $1\text{nm} = \dots\dots\dots\text{m}$
 a) 10^{-9} b) 10^{-11} c) 10^{-6} d) 10^{-8}
- 15) Wavelength of sodium source
 a) $\lambda = 5896 \text{ \AA}$ b) 6896 \AA c) 7896 \AA d) 8896 \AA
- 16) In optical spectrometer, $1^\circ = \dots\dots\dots\text{min.}$
 a) 30 b) 60 c) 45 d) 90
- 17) Diameter of capillary tube is measured using
 a) meter scale b) Vernier Caliper
 c) Micrometer screw gauge d) Travelling Micrometer
18. Current sensitivity of ballistic galvanometer is define as.....
 a) current in micro ampere required to consume one millimeter deflection on a scale
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Vivekanand College (Autonomous), Kolhapur.

Basic Instrumentation Course in Physics

2019-2020

Result

Date : 04/02/2020

Sr. No.	Name of the student	Marks obtained (out of 20)	Result
1	Miss. Benake Ragini Jayprakash	20	Pass
2	Miss. Bhatnare Shivani Sanjay	15	Pass
3	Miss. Dhavale Swarupa Baburao	14	Pass
4	Miss. Dingane Sandhya sudhakar	13	Pass
5	Miss. Jadhav Pratiksha Harish	15	Pass
6	Miss. Jadhav Shraddha Dinkar	18	Pass
7	Miss. Jagadale Manasi Khanderao	17	Pass
8	Miss. Josef Susen Livis	20	Pass
9	Miss. Koshti Shweta Jitendra	20	Pass
10	Miss. Kulkarni Manasi Vinayak	15	Pass
11	Miss. Lohar Neha Shankar	20	Pass
12	Miss. Magdum Samruddhi Gunda	19	Pass
13	Miss. Methe Kishori Prakash	19	Pass
14	Miss. Mohite Tanvi Vikas	14	Pass
15	Miss. More Akshada Vijay	13	Pass
16	Miss. Mudekar Rutuja Ramchandra	12	Pass
17	Miss. Nalavade Ankita Amar	15	Pass
18	Miss. Nirmale Sakshi Sunil	15	Pass
19	Miss. Patil Amruta Bhujgonda	14	Pass
20	Miss. Patil Kirti Vijay	14	Pass
21	Miss. Patil Sujata Anandrao	12	Pass
22	Miss. Patil Sunita Ashok.	13	Pass
23	Miss. Potdar Aishwarya Sharad	13	Pass
24	Miss. Sawant Shreya Gopal	15	Pass
25	Miss. Shinde Radhika Baburao	20	Pass
26	Miss. Shinde Swaranjali Sankay	20	Pass
27	Miss. Sutar Vaishnavi Suresh	19	Pass
28	Miss. Zingare Yogita vishnu	19	Pass
29	Mr. Chougule Abhijeet Bajiraw	18	Pass
30	Mr. Dalvi Tejas Chetan	17	Pass
31	Mr. Gaikwad Suraj Dhananjay	20	Pass
32	Mr. Ghatage Sourabh Vijay	19	Pass
33	Mr. Ghosalkar Pranav Shankar	20	Pass
34	Mr. Kadam Sourabh Mahadev	20	Pass
35	Mr. Kamble Abhishek Pandhurang	14	Pass



36	Mr. Kamble Prasad V.	15	Pass
37	Mr. Killedar Yogiraj Rajendra	16	Pass
38	Mr. Kotale Sujit Dinkar	12	Pass
39	Mr. Kumbhar Jaywant R.	14	Pass
40	Mr. Kumbhar Prathmesh M.	20	Pass
41	Mr. Paranjape Anish Shriram	20	Pass
42	Mr. Sabale Abhishek Dattatray	20	Pass
43	Mr. Savant Rohit Ramchandra	19	Pass
44	Mr. Sutar Pravin Rajendra	18	Pass
45	Mr. Thanekar Vaibhav Mahendra	17	Pass
46	Mr. Tibile Rohan Arjun	12	Pass




Head

Department of Physics

HEAD
DEPARTMENT OF PHYSICS
VIVEKANAND COLLEGE, KULKARNI
(AUTONOMOUS)

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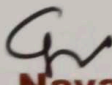
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Certificate

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class.....has Completed the Add on \COC Course in "BASIC
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Physics during 2019-2020 academic Year.




Dr. G. J. Navathe
Course-ordinator


Dr. M. M. Karanjkar
HOD

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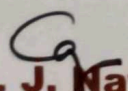
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
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class.....has Completed the Add on \COC Course in "BASIC
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Dr. G. J. Navathe
Course-ordinator




Dr. M. M. Karanjkar
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class.....has Completed the Add on \COC Course in "BASIC
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Dr. G. J. Navathe
Course-ordinator

Dr. M. M. Karanjkar
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This is to certify that Mr./Ms. Mudekar Rutuja Ramchandra
class.....has Completed the Add on \COC Course in "BASIC
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Physics during 2019-2020 academic Year.




Dr. G. J. Navathe
Course-ordinator


Dr. M. M. Karanjkar
HOD