

**SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.**

**Department of Mathematics**

**Internal Assesment Record-PG-(CIE)-2022-2023**

<b>Class</b>	<b>Paper</b>	<b>Teacher Name</b>	<b>Sign</b>
SEM-I	Paper I	Chanchal Jain	<i>Chanchal Jain</i>
	PaperII	Chanchal Jain & S.V. Zade	<i>Chanchal Jain S.V. Zade</i>
	Paper III	Ajay Maurya And Dr. V.T.Chauhan	<i>Ajay Maurya Dr. V.T. Chauhan</i>
	Paper IV	Ajay Maurya	<i>Ajay Maurya</i>
	Paper V	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>
SEM-II	Paper I	Chanchal Jain	<i>Chanchal Jain</i>
	PaperII	Sandhya Chauhan	<i>Sandhya Chauhan</i>
	Paper III	Sandhya Chauhan	<i>Sandhya Chauhan</i>
	Paper IV	Sandhya Chauhan & Chanchal Jain	<i>Sandhya Chauhan Chanchal Jain</i>
	Paper V	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>
SEM-III	Paper I	Chanchal Jain	<i>Chanchal Jain</i>
	PaperII	Chanchal Jain	<i>Chanchal Jain</i>
	Paper III	Sandhya Chauhan	<i>Sandhya Chauhan</i>
	Paper IV	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>
	Paper V	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>
SEM-IV	Paper I	Chanchal Jain	<i>Chanchal Jain</i>
	PaperII	Sandhya Chauhan	<i>Sandhya Chauhan</i>
	Paper III	Chanchal Jain	<i>Chanchal Jain</i>
	Paper IV	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>
	Paper V	Dr. V.T. Chauhan	<i>Dr. V.T. Chauhan</i>



*Dr. V.T. Chauhan*  
**HEAD**

**Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.**

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -I (2022-23)

Paper -I(Algebra I)  
Internal Marks

Teacher Name: Chanchal Jain

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	6	4	3	5	18
3		Ku. Darshana S. Mude	10	5	4	5	24
4		Ku. Divya Bandu Ahirkar	10	4	4	5	23
5		Ku. Gunjan Shivprakash Sharma	10	5	4	5	24
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	24
7		Lalit Ramchandra Rajgire	7	4	3	4	18
8		Ku. Neha Vinod Manmode	10	5	4	5	24
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	4	2	4	16
14		Shrikant L. Tripathi	8	3	3	4	18
15		Shubham Shankar Hulke	8	3	3	3	17
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	4	5	24
19		Ku. Trupti Arun Akhare	10	5	4	5	24



*Chanchal Jain*  
HEAD

Department of Mathematics  
Science College, Congress Nagar  
NAGPUR.

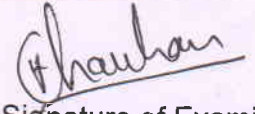


**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**

**Internal Marks Sheet**

**Exam Name : FIRST SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)**  
**Subject Name : ALGEBRA-I**  
**College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE**  
**Session : Winter-2022**

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	730118	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	730119	202010001147281	AMAVALI ARUN PATIL	18
3	730120	2015016601458872	DARSHANA SANJAYRAO MUDE	24
4	730121	202010001147521	DIVYA BANDU AHIRKAR	23
5	730122	20201055210451	GUNJAN SHIVPRAKASH SHARMA	24
6	730123	201730944004613	KARISHMA BABULALJI PANDHARE	24
7	730124	20191011315341	LALIT RAMCHANDRA RAJGIRE	18
8	730125	20201011513593	NEHA VINOD MANMODE	24
9	730126	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	730127	20201056403617	PRITI DINESH PATLE	25
11	730128	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	730129	-	RENU KISHORE PATNE	24
13	730130	20201010012777	SAKSHI ANIL SONTAKKE	16
14	730131	-	SHRIKANT LALJI TRIPATHI	18
15	730132	20191000107444	SHUBHAM SHANKAR HULKE	17
16	730133	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	730134	-	SWETA ASHOK UPASE	25
18	730135	20201011607554	TANUSHREE DEVAJI BHUJADE	24
19	730136	20191011315242	TRUPTI ARUNRAO AKHARE	24

  
Signature of Examinee

Print Date & Time: 03-04-2023 02-07-13 PM

  
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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc I Semester I  
Paper-I Algebra-I  
Unit Test-I  
Date: 1<sup>st</sup> Sept 2022**

Duration : 1 Hour ]

[ Max mark: 25 Marks

**Attempt Any ONE questions**

1. (a) Find the different necklaces with  $p$  beads, ( $p$ -prime), where the beads can have any  $n$  different colour. (10)
- (b) If  $G$  is a finite cyclic group of order  $n$ , then show that the order of  $\text{Aut}(G)$ , the group of automorphisms of  $G$  is  $\Phi(n)$  (10)

**OR**

2. (a) Define symmetric group of a non empty set, and group of symmetries of a set of points. Obtain the group of symmetries of an equilateral triangle and a square. (10)
- (b) Define a complete group. Show that the symmetric group  $S_3$  is complete group. (10)

**Compulsory Questions**

3. (a) State the following theorem : (05)
1. First isomorphism theorem
  2. Second isomorphism theorem
  3. Third isomorphism theorem.

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HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-I)  
Session (2022-23)**

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**Subject: Algebra 1  
Assignment**

Que.1 Define a Euclidean Domain. Show that the ring of Gaussian integers

$R = \{m+n\sqrt{-1} : m, n \in \mathbb{Z}\}$  is an Euclidean Domain.

Que.2 State and prove Jordan –Holder theorem. Also show that this theorem implies the fundamental theorem of arithmetic's.

Que.3 show that ring of Gaussian integers is an Euclidean Domain.

Que.4 Show that every nilpotent group is solvable.

Que.5 Define a complete group. Show that the symmetric group  $S_3$  is complete group.

*eJain*

*amr*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem I

Subject: Algebra - I

Theory / Practical:

Sri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

M.Sc. I (Mathematics) Sem - I

Attendance Sheet 2022-2023

November  
Chanchal Jain

Month

Teacher's Name

13 days

S.N	Name	Total Upto		Periods	Date																						
		last Month	Att		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total		
13	Abhishek Yadav		33/50	4/12	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	21/11
14	Amavali Arun Patil		16/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
15	Darshana S. Gude		17/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
16	Divya Bandu Ahirkar			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
17	Gunjan Shiyprakash Sharma			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
18	Karishma Babulaji Pandhare			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
19	Lalit Ramchandra Rajgire			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
20	Neha Vinod Manmode		21/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
21	Prachi Harichandra Meharikule		32/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
22	Priti Dinesh Patle		32/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
23	Priya Bimalkumar Maity		7/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
24	Renu Kishor Patne		8/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
25	Sakshi A. Sontakke			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
26	Shrikant L. Tripathi			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
27	Shubham Shankar Hulke			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
28	Shubhangi Totaramji Barde		17/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
29	Sweta Ashok Upase			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
30	Tanushree Devaji Bhujade			4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
31	Trupti Arun Akhare		27/50	4/12	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

Chanchal Jain  
Teacher

Head of Department

Principal

**HEAD**  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem I  
 Subject : Algebra - I  
 Theory / Practical :

Sri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I (Mathematics) Sem - I

Month Dec / Jan 2-3  
 Teacher's Name Chanchal Jain

2018/19

Attendance Sheet 2022-2023

S.N	Name	Total Upto last Month		Periods		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Current Month	Progressive Month					
		Att	Del	8/12	9/12																												
18	Abhishek Yadav	P	P	8/12	9/12																P	P	9/12	10/12									
03	Amavali Arun Patil	P	P																														
13	Darshana S. Mude	P	P																														
10	Divya Bandu Ahirkar	P	P																														
09	Gunjan Shivprakash Sharma	P	P																														
10	Karishma Babulaji Pandhare	P	P																														
-	Lalit Ramchandra Rajgire	-	-																														
07	Neha Vinod Manmode	P	P																														
14	Prachi Harichandra Meharkule	P	P																														
16	Priti Dinesh Patle	P	P																														
14	Priya Bimalkumar Maity	-	-																														
08	Renu Kishor Patne	P	P																														
-	Sakshi A. Sontakke	-	-																														
09	Shrikant L. Tripathi	-	-																														
-	Shubham Shankar Hulike	-	-																														
17	Shubhangi Totaramji Barde	P	P																														
12	Sweta Ashok Upase	P	P																														
04	Tanushree Devaji Bhujade	P	P																														
12	Trupti Arun Akhare	P	P																														

*Chanchal Jain*  
 Teacher

*[Signature]*  
 Head of Department

Principal

Chanchal Jain

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / Batch: Sem I  
 Subject: Algebra  
 Theory / Practical :

Sri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I (Mathematics) Sem - I  
 Attendance Sheet 2022-2023

Month  
 Teacher's Name

January 23  
 Chanchal Jain

44 days

S.N	Name	Total Upto last Month		Periods																Total	Progressive Month						
		Deli	Att	Date		1	2	3	4	5	6	7	8	9	10	11	12	13	14			15	16	17	18	19	20
10	1	Abhishek Yadav				P	P	P	P	P	P	P	P	P	P	P	P	10									
	2	Ku Amavali Arun Patil				-	-	-	-	-	-	-	-	-	-	-	-										
	3	Ku Darshana S. Mude				-	-	-	-	-	-	-	-	-	-	-	-										
	4	Ku Divya Bandu Ahirkar				-	-	-	-	-	-	-	-	-	-	-	-										
02	5	Ku Gunjan Shivprakash Sharma				P	P	P	P	P	P	P	P	P	P	P	2										
	6	Ku Karishma Babulaji Pandhare				-	-	-	-	-	-	-	-	-	-	-	-										
	7	Lalit Ramchandra Rajgire				-	-	-	-	-	-	-	-	-	-	-	-										
	8	Ku Neha Vinod Manmode				-	-	-	-	-	-	-	-	-	-	-	-										
	9	Ku Prachi Harichandra Meharkule				-	-	-	-	-	-	-	-	-	-	-	-										
01	10	Ku Priti Dinesh Patle				P	P	P	P	P	P	P	P	P	P	P	1										
08	11	Ku Priya Bimalkumar Maity				P	P	P	P	P	P	P	P	P	P	P	2										
62	12	Ku Renu Kishor Patne				P	P	P	P	P	P	P	P	P	P	P	1										
01	13	Ku Sakshi A. Sontakke				-	-	-	-	-	-	-	-	-	-	-	-										
	14	Shrikant L. Tripathi				-	-	-	-	-	-	-	-	-	-	-	-										
	15	Shubham Shankar Hulke				-	-	-	-	-	-	-	-	-	-	-	-										
08	16	Ku Shubhangi Totaramji Barde				P	P	P	P	P	P	P	P	P	P	P	8										
04	17	Ku Sweta Ashok Upase				P	P	P	P	P	P	P	P	P	P	P	4										
01	18	Ku Tanushree Devaji Bhujade				-	-	-	-	-	-	-	-	-	-	-	-										
06	19	Ku Trupti Arun Akhare				P	P	P	P	P	P	P	P	P	P	P	6										

Chanchal Jain  
 Teacher

Chanchal - Jain

Head of Department

Principal

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.



SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -I (2022-23)  
Paper -II(Real Analysis I)  
Internal Marks

Teacher Name: Chanchal Jain and S.V.Zade

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	6	4	3	5	18
3		Ku. Darshana S. Mude	10	5	4	5	24
4		Ku. Divya Bandu Ahirkar	10	4	3	5	23
5		Ku. Gunjan Shivprakash Sharma	10	5	4	5	24
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	24
7		Lalit Ramchandra Rajgire	7	4	3	4	17
8		Ku. Neha Vinod Manmode	10	5	4	5	24
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	4	2	4	16
14		Shrikant L. Tripathi	8	3	3	3	17
15		Shubham Shankar Hulke	9	3	3	3	18
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	5	5	25
19		Ku. Trupti Arun Akhare	10	5	5	5	25

*S.V.Zade*



*S.V.Zade*  
HEAD

Department of Mathematics  
Science College, Congress Nagar  
NAGPUR.



**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**

**Internal Marks Sheet**

**Exam Name : FIRST SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)**  
**Subject Name : REAL ANALYSIS-1**  
**College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE**  
**Session : Winter-2022**

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max
1	730118	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	730119	202010001147281	AMAVALI ARUN PATIL	18
3	730120	2015016601458872	DARSHANA SANJAYRAO MUDE	24
4	730121	202010001147521	DIVYA BANDU AHIRKAR	23
5	730122	20201055210451	GUNJAN SHIVPRAKASH SHARMA	24
6	730123	201730944004613	KARISHMA BABULALJI PANDHARE	24
7	730124	20191011315341	LALIT RAMCHANDRA RAJGIRE	17
8	730125	20201011513593	NEHA VINOD MANMODE	24
9	730126	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	730127	20201056403617	PRITI DINESH PATLE	25
11	730128	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	730129	-	RENU KISHORE PATNE	24
13	730130	20201010012777	SAKSHI ANIL SONTAKKE	16
14	730131	-	SHRIKANT LALJI TRIPATHI	17
15	730132	20191000107444	SHUBHAM SHANKAR HULKE	18
16	730133	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	730134	-	SWETA ASHOK UPASE	25
18	730135	20201011607554	TANUSHREE DEVAJI BHUJADE	25
19	730136	20191011315242	TRUPTI ARUNRAO AKHARE	25

Signature of Examinee

Print Date & Time: 03-04-2023 02-15-08 PM

HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur**

**Department of Mathematics**

**M.Sc I Semester I**

**Paper-II Real Analysis-I**

**Unit Test-I**

**Date: 2<sup>nd</sup> Sept. 2022**

**Duration : 1 Hour ]**

**[ Max mark: 25 Marks**

**Attempt Any ONE questions**

**UNIT—I**

1. (a) State and prove the Stone-Weierstrass theorem. 10  
(b) For  $n = 1, 2, 3, \dots$ ,  $x$  real, put  $f_n(x) = \frac{x}{1+nx^2}$ . Show that  $\{f_n\}$  converges uniformly to a function  $f$  and that the equation  $f'(x) = \lim_{n \rightarrow \infty} f'_n(x)$  is correct if  $x \neq 0$ , but false if  $x = 0$ . 10
2. (a) If  $\{f_n\}$  is a pointwise bounded sequence of complex functions on a countable set  $E$ , then prove that  $\{f_n\}$  has a subsequence  $\{f_{n_k}\}$  such that  $\{f_{n_k}(x)\}$  converges for every  $x \in E$ . 10  
(b) Show that a convergent series :

$$\sum_0^{\infty} f_n(x) = \sum_0^{\infty} \frac{x^2}{(1+x^2)^n}, \quad (x \text{ real}), n = 0, 1, 2, 3, \dots$$

is a continuous function may have discontinuous sum. Further show that the sequence  $\{f'_n\}$  does not converge to  $f'$ , where :

$$f_n(x) = \frac{\sin nx}{\sqrt{n}}, \quad (x \text{ real}), n = 1, 2, 3, \dots \quad 10$$

**COMPULSORY**

3. (a) Define Uniform convergence series and partial derivatives 05

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**HEAD**

**Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.**

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-I)  
Session (2022-23)**

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**Subject: Real Analysis-I  
Assignment**

Que. 1. Define Contraction, if  $X$  is complete matrix space and if  $F$  is contraction of  $X$  into  $X$  than Prove that there exist one and only one  $x \in X$  such that  $f(x)=x$

Que.2. State and Prove Stone-Weirstrass Theorem .

Que. 3. Prove that the Linear operator  $A$  on a finite dimensional vector space  $X$  is one to one iff the range of  $A$  is all of  $X$ .

Que. 4. Define Differentiability of a mapping  $F: E \rightarrow R_m$  Where  $E$  is an open subset of  $R_m$

Que. 5. Define Uniform convergence series and Partial derivative.

  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / \Batch: Sem III

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Month: August - 2022  
Teacher's Name: S.V. Zade / chanchal chain

Subject: Real Analysis I  
Theory / Practical:

M.Sc. I (Mathematics) Sem - I

Attendance Sheet (2022-2023)

S.N	Name	Total	Period											Total	Current Month	Progressive Month																								
			1	2	3	4	5	6	7	8	9	10	11				12	13	14	15	16	17	18	19	20															
1	Abhishek Yadav																																							
2	Ku Amavali Arun Patil																																							
3	Ku. Darshana S. Mude																																							
4	Ku Divya Bandu Ahirkar																																							
5	Ku Gunjan Shivprakash Sharma																																							
6	Ku. Karishma Babulaji Pandhare																																							
7	Lalit Ramchandra Rajgire																																							
8	Ku Neha Vinod Manmode																																							
9	Ku Prachi Harichandra Meharikule																																							
10	Priti Dinesh Patle																																							
11	Ku Priya Bimalkumar Maity																																							
12	Ku Renu Kishor Patne																																							
13	Ku Sakshi A. Sontakke																																							
14	Shrikant L. Tripathi																																							
15	Shubham Shankar Hulke																																							
16	ku Shubhangi Totaramji Barde																																							
17	ku Sweta Ashok Upase																																							
18	ku Tanushree Devajji Bhujade																																							
19	ku Trupti Arun Akhare																																							

Teacher

*Sah Jain*

Head of Department

*AMR*

Principal

HEAD

Department of Mathematics

Science College, Congress Nagar,

NAGPUR.

Section / Batch: Sem II

Subject: *Real Analysis I*  
Theory / Practical:

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
M.Sc. I (Mathematics) Sem - I

Month: *Nov-Dec-2022*

Teacher's Name: *S.V. Zade* / *chanchal Jai*

Attendance Sheet(2022-2023)

S.N	Name	Total	Perit Date	Date																			Total	Current Month	Progressive Month			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20		
1	Abhishek Yadav		<i>29/11</i>	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
2	Amaali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
4	Divya Bandu Ahirkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
5	Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
6	Ku. Karishma Babulaji Pandhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
7	Lalit Ramchandra Rajgire			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
9	Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
10	Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
17	Sweta Ashok Upase			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			

*S.S.*

Teacher

*S.V. Zade*

Head of Department

Principal

**HEAD**  
Department of Mathematics  
Science College, Congress Nagar,  
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**SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.**

**Department of Mathematics  
M.Sc. I Semester -I (2022-23)**

**Paper -III(Topology I)  
Internal Marks**

**Teacher Name: Ajay Morya and V.T. Chauhan**

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	6	4	3	5	18
3		Ku. Darshana S. Mude	10	5	5	5	25
4		Ku. Divya Bandu Ahirkar	10	5	4	5	24
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	24
7		Lalit Ramchandra Rajgire	7	4	3	3	17
8		Ku. Neha Vinod Manmode	10	5	4	5	24
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	4	2	4	16
14		Shrikant L. Tripathi	8	3	3	3	17
15		Shubham Shankar Hulke	9	3	3	3	18
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	5	5	25
19		Ku. Trupti Arun Akhare	10	5	4	5	24

*Ajaya*



*Amo*  
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NAGPUR.**



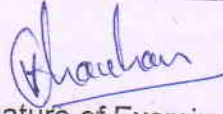
RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR


Internal Marks Sheet

Exam Name : FIRST SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)  
Subject Name : TOPOLOGY-I  
College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE  
Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max
1	730118	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	730119	202010001147281	AMAVALI ARUN PATIL	25
3	730120	2015016601458872	DARSHANA SANJAYRAO MUDE	18
4	730121	202010001147521	DIVYA BANDU AHIRKAR	25
5	730122	20201055210451	GUNJAN SHIVPRAKASH SHARMA	24
6	730123	201730944004613	KARISHMA BABULALJI PANDHARE	25
7	730124	20191011315341	LALIT RAMCHANDRA RAJGIRE	24
8	730125	20201011513593	NEHA VINOD MANMODE	17
9	730126	20201010012730	PRACHI HARICHANDRA MEHARKULE	24
10	730127	20201056403617	PRITI DINESH PATLE	25
11	730128	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	730129	-	RENU KISHORE PATNE	25
13	730130	20201010012777	SAKSHI ANIL SONTAKKE	24
14	730131	-	SHRIKANT LALJI TRIPATHI	16
15	730132	20191000107444	SHUBHAM SHANKAR HULKE	17
16	730133	191040776	SHUBHANGI TOTARAMJI BARDE	18
17	730134	-	SWETA ASHOK UPASE	25
18	730135	20201011607554	TANUSHREE DEVAJI BHUJADE	25
19	730136	20191011315242	TRUPTI ARUNRAO AKHARE	24

Print Date & Time: 03-04-2023 02:19:39 PM

  
Signature of Examinee

  
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Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Department of Mathematics

M.Sc I Semester I

Paper-III Topology-I

Unit Test-I

Date: 03<sup>rd</sup> Sept. 2022

Duration : 1 Hour ]

[ Max mark: 25 Marks

Attempt Any ONE questions

1. (a) If there is an injective mapping from a non -empty set B to Z then prove that B is countable . (10)
- (b) Prove that the intersection of any number of topologies on a non -empty set X is a topology. (10)

OR

2. (a) Prove that an infinite set contains a countable set. Also prove that an infinite set is equipotent to one of its proper subset. (10)
- (b) If a and b are the cardinal number of arbitrary set A and B respectively , then prove that  $a^b$  is a cardinal number of a set of all mapping from B to A. (10)

Compulsory

3. (a) For a set A and B in a topological space X proved that  $A \subset B \Rightarrow c(A) \subset c(B)$  (05)

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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-I)  
Session (2022-23)**

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**Subject: Topology-I  
Assignment**

Que.1 If there is an injective mapping from a non-empty set B to  $\mathbb{Z}$  then prove that B is countable.

Que.2. For a set A and B is a topological space X proved that  $A \subset B \Rightarrow c(A) \leq c(B)$

Que.3 Proved that an infinite set contained a countable set . also prove that an infinite set is equipotent to one of its proper subset.

Que.4 prove that the intersection of any number of topologies on non empty is a topology.

Que.5 If a and b are the cardinal number of arbitrary set A and B respectively then prove that  $a^b$  is a cardinal number of set of all mapping from B to A.

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Section / \Batch: Sem I  
 Subject : TOPO-I  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I (Mathematics) Sem - I

Months ep/oct/Nov/2022  
 Teacher's Name: V. T. Chauhan & Ajay Maurya

Attendance Sheet(2022-2023)

S.N	Name	Total		Period																			Total	Current Month	Progressive Month						
		Deli	Att	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20					
1	Abhishek Yadav			8/9	10/9	14/9	19/9	22/9	24/9	26/9	28/9	01/10	03/10	05/10	07/10	09/10	11/10	12/10	14/10	15/10	17/10	19/10	21/10	23/10	25/10	27/10	29/10	31/10			
2	Amavali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
4	Divya Bandu Ahirkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
5	Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
6	Ku. Karishma Babulaji Pandhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
7	Lalit Ramchandra Rajgire			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
9	Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
10	Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
17	Sweta Ashok Upase			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		

Chauhan  
 Teacher

[Signature]  
 Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / \Batch: Sem I  
 Subject : Topo - I  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I(Mathematics) Sem - I

Month: Dec / Jan - 2022  
 Teacher's Name: N.T. Chauhan / Ajay Morye

Attendance Sheet(2022-2023)

S.N	Name	Total	Perit	Date																			Total	Current Month	Progressive Month				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20			
1	Abhishek Yadav			19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12	19/12					
2	Amavali Arun Patil																												
3	Ku. Darshana S. Mude																												
4	Divya Bandu Ahirkar																												
5	Gunjan Shivprakash Sharma																												
6	Ku. Karishma Babulaji Pandhare																												
7	Lalit Ramchandra Rajgire																												
8	Neha Vinod Manmode																												
9	Prachi Harichandra Meharkule																												
10	Priti Dinesh Patle																												
11	Priya Bimalkumar Maity																												
12	Renu Kishor Patne																												
13	Sakshi A. Sontakke																												
14	Shrikant L. Tripathi																												
15	Shubham Shankar Hulke																												
16	Shubhangi Totaramji Barde																												
17	Sweta Ashok Upase																												
18	Tanushree Devaji Bhujade																												
19	Trupti Arun Akhare																												

A Chauhan  
 Teacher

[Signature]  
 Head of Department

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HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -I (2022-23)

Paper -IV(Ordinary Differential Equation)  
Internal Marks

Teacher Name: Ajay Morya

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	6	4	3	5	18
3		Ku. Darshana S. Mude	10	5	4	5	24
4		Ku. Divya Bandu Ahirkar	10	5	4	5	24
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	24
7		Lalit Ramchandra Rajgire	7	4	2	4	17
8		Ku. Neha Vinod Manmode	10	5	4	5	25
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	4	2	4	16
14		Shrikant L. Tripathi	8	3	2	3	16
15		Shubham Shankar Hulke	9	3	3	3	18
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	4	5	24
19		Ku. Trupti Arun Akhare	10	5	4	5	24

*Ajay Morya*



*Ajay Morya*  
HEAD

Department of Mathematics  
Science College, Congress Nagar  
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**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**


**Internal Marks Sheet**

**Exam Name : FIRST SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)**  
**Subject Name : ORDINARY DIFFERENTIAL EQUATIONS**  
**College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE**  
**Session : Winter-2022**

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	730118	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	730119	202010001147281	AMAVALI ARUN PATIL	13
3	730120	2015016601458872	DARSHANA SANJAYRAO MUDE	24
4	730121	202010001147521	DIVYA BANDU AHIRKAR	24
5	730122	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	730123	201730944004613	KARISHMA BABULALJI PANDHARE	24
7	730124	20191011315341	LALIT RAMCHANDRA RAJGIRE	17
8	730125	20201011513593	NEHA VINOD MANMODE	25
9	730126	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	730127	20201056403617	PRITI DINESH PATLE	25
11	730128	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	730129	-	RENU KISHORE PATNE	24
13	730130	20201010012777	SAKSHI ANIL SONTAKKE	16
14	730131	-	SHRIKANT LALJI TRIPATHI	16
15	730132	20191000107444	SHUBHAM SHANKAR HULKE	19
16	730133	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	730134	-	SWETA ASHOK UPASE	25
18	730135	20201011607554	TANUSHREE DEVAJI BHUJADE	24
19	730136	20191011315242	TRUPTI ARUNRAO AKHARE	24

  
Signature of Examinee

Print Date & Time: 03-04-2023 02:24:53 PM

  
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Science College, Congress Nagar,  
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Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Department of Mathematics

M.Sc I Semester I

Paper-IV Ordinary Differential Equation

Unit Test-II

Date: 5<sup>th</sup> Sept. 2022

Duration : 1 Hour ]

[ Max mark: 25 Marks

Attempt Any ONE questions

- (a) Prove that there exist Linearly independent solution of  $L(y) = 0$  on I. (10)
- (b) Find two linearly independent solution of the following equation  
 $(3x-1)^2 y'' + (9x-3)y' - 9y = 0$ . (10)

OR

3. (a) One solution of  $x^2 y'' - xy' = 0$ ,  $x \geq 0$  is  $\phi_1(x) = x$ . find the solution  $\phi_2$  of  
 $x^2 y'' - xy' = 0$ ,  $x \geq 0$  is  $\phi_1(x) = x^2$  satisfying  $\phi_1(1) = 1$  and  $\phi_1'(1) = 0$ . (10)
- (b) Verify that  $\phi_1(x) = x^2$  is a solution of  $L(y) = y'' - 2/x^2 = 0$  ( $0 < x < \infty$ ).  
Find the basis for the solution of  $L(y) = 0$ . (10)

Compulsory

3. (a) write formula for wronskian . (05)

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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-I)  
Session (2022-23)**

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**Subject: Ordinary Differential Equation  
Assignment**

Que1. State and prove Euler's theorem.


Que2. Show that  $J_{\alpha-1}(x) - J_{\alpha+1}(x) = 2J'_{\alpha}(x)$

Que3. Derives the Bessel's equation for zero order.

Que 4. Find all the solution for the equation  $x^2y'' + xy' + 4y = 1$

Que5. Proved that there exist linearly independent solution of  $L(y)=0$  on  $I$ .

Ameyy

  
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Section / Batch: Sem I

Subject : DDE

Theory / Practical :

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

M.Sc. I(Mathematics) Sem - I

Attendance Sheet(2022-2023)

Month: Nov/Dec/January - 2022  
Teacher's Name: Ajay Maurya

S.N	Name	Total	Peri Date	Attendance																			Progressive Month			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	Total	
1	Abhishek Yadav		21/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
2	Amavali Arun Patil			.	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Divya Bandu Ahirkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Gunjan Shivprakash Sharma			.	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku. Karishma Babulaji Pandhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Lalit Ramchandra Rajgire			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sweta Ashok Upase			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

Ajay Maurya  
Teacher

Head of Department

**HEAD**  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Principal

Section / Batch: Sem I

Subject: ODE

Theory / Practical:

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

M.Sc. I (Mathematics) Sem - I

Attendance Sheet (2022-2023)

Month: SEP / OCT / NOV - 2022  
Teacher's Name: Ajay Maurya

S.N	Name	Total	Deli	Att	Peri		8	9	10	11	12	13	14	15	16	17	18	19	20	Total		Progressive Month				
					1	2														3	4		5	6	7	Current Month
					<u>8/10</u>	<u>19/19</u>	<u>20/20</u>	<u>21/21</u>	<u>01/01</u>	<u>02/02</u>	<u>03/03</u>	<u>04/04</u>	<u>05/05</u>	<u>06/06</u>	<u>07/07</u>	<u>08/08</u>	<u>09/09</u>	<u>10/10</u>	<u>11/11</u>	<u>12/12</u>	<u>13/13</u>	<u>14/14</u>	<u>15/15</u>			
1	Abhishek Yadav				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
2	Ku Amavali Arun Patil				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
3	Ku. Darshana S. Mude				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
4	Ku Divya Bandu Ahirkar				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
5	Ku Gunjan Shivprakash Sharma				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
6	Ku. Karishma Babulaji Pandhare				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
7	Lalit Ramchandra Rajgire				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
8	Ku Neha Vinod Manmode				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
9	Ku Prachi Harichandra Meharkule				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
10	Priti Dinesh Patle				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
11	Ku Priya Bimalkumar Maity				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
12	Ku Renu Kishor Patne				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
13	Ku Sakshi A. Sontakke				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
14	Shrikant L. Tripathi				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
15	Shubham Shankar Hulke				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
16	Ku Shubhangi Totaramji Barde				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
17	Ku Sweta Ashok Upase				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
18	Ku Tanushree Devaji Bhujade				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
19	Ku Trupti Arun Akhare				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		

Ajay Maurya  
Teacher

Head of Department

Principal

HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

**SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.**

**Department of Mathematics  
M.Sc. I Semester -I (2022-23)  
Paper -V(Integral Equation)  
Internal Marks**

**Teacher Name: Dr. Vidya Chauhan**

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	9	4	3	3	19
3		Ku. Darshana S. Mude	10	5	4	5	24
4		Ku. Divya Bandu Ahirkar	10	5	4	5	24
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	25
7		Lalit Ramchandra Rajgire	7	4	3	4	18
8		Ku. Neha Vinod Manmode	10	5	5	5	25
9		Ku. Prachi Harichandra Meharkule	10	5	4	5	24
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	3	3	3	15
14		Shrikant L. Tripathi	8	4	3	4	19
15		Shubham Shankar Hulke	9	3	3	3	18
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	5	5	25
19		Ku. Trupti Arun Akhare	10	5	5	5	25

*Chauhan*



*Dr. Vidya Chauhan*  
**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR.**



**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**

**Internal Marks Sheet**

**Exam Name :** FIRST SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)  
**Subject Name :** INTEGRAL EQUATIONS  
**College Name :** (100) SHRI SHIVAJI SCIENCE COLLEGE  
**Session :** Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	730118	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	730119	202010001147281	AMAVALI ARUN PATIL	19
3	730120	2015016601458872	DARSHANA SANJAYRAO MUDE	24
4	730121	202010001147521	DIVYA BANDU AHIRKAR	24
5	730122	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	730123	201730944004613	KARISHMA BABULALJI PANDHARE	25
7	730124	20191011315341	LALIT RAMCHANDRA RAJGIRE	18
8	730125	20201011513593	NEHA VINOD MANMODE	25
9	730126	20201010012730	PRACHI HARICHANDRA MEHARKULE	24
10	730127	20201056403617	PRITI DINESH PATLE	25
11	730128	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	730129	-	RENU KISHORE PATNE	24
13	730130	20201010012777	SAKSHI ANIL SONTAKKE	15
14	730131	-	SHRIKANT LALJI TRIPATHI	19
15	730132	20191000107444	SHUBHAM SHANKAR HULKE	18
16	730133	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	730134	-	SWETA ASHOK UPASE	25
18	730135	20201011607554	TANUSHREE DEVAJI BHUJADE	25
19	730136	20191011315242	TRUPTI ARUNRAO AKHARE	25

*Chauhan*

Signature of Examinee

Print Date & Time: 03-04-2023 02:28-59 PM

*mm*  
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**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR.**

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Department of Mathematics

M.Sc-I Semester-I

Paper-V Integral equation

Unit Test-I

Date: 6<sup>th</sup> Sept. 2022

Duration: 1 Hour ]

[ Max mark: 25 Marks

Attempt Any ONE questions

1. (a) Transform the DE :

$$y'' - \lambda y = \cos x, y(0) = 0, y'(1) = 0, \lambda > 0$$

into integral equation.

10

- (b) Convert the DE :

$$\frac{d^2y}{dx^2} + 4y = f(x), 0 \leq x \leq \frac{\pi}{2}$$

$$y(0) = 0, y'\left(\frac{\pi}{2}\right) = 0$$

into integral equation.

10

2. (a) Find the solution of integro-differential equation :

$$u'(x) + \int_0^1 \exp(x-y)u(y)dy = f(x), 0 \leq x \leq 1$$

where  $u(0) = 0$ .

10

- (b) Transform the problem :

$$Ly + \lambda r(x) y = 0, x_1 \leq x \leq x_2$$

with boundary conditions :

$$a_1 y(x_1) + b_1 y'(x_1) = 0$$

$$a_2 y(x_2) + b_2 y'(x_2) = 0$$

where :

$$L_y = \frac{d}{dx} \left[ p(x) \frac{dy}{dx} \right] - q(x) y$$

into integral equation.

10

(Compulsory)

- (a) Form the integral equation corresponding to :

$$y'' + 2xy' + y = 0, y(0) = 1, y'(0) = 0.$$

5

  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
Amravati.



**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-I)  
Session (2022-23)**

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**Subject: Integral Equation  
Assignment**

**Que.1.** Solve the integral equation

$$\int_0^x \sin \alpha(x-y) \varphi(y) dy = x$$

**Que.2.** What is the solution of the Integro-differential equation.

$$u'(x) + \int_0^1 \exp(x-y)u(y)dy = f(x) \quad , \quad 0 \leq x \leq 1, \quad \text{where } u(0) = 0$$

**Que.3.** Transform the given differential equation into an integral equation

$$y''(x) + 2xy'(x) + y(x) = 0 \quad , \quad y(0) = 1, \quad y'(0) = 0$$

**Que.4.** Find the solution of the system of equations

$$\varphi_1(x) = 1 + \int_0^x \varphi_2(y) dy$$

$$\varphi_2(x) = e^{2x} - \int_0^x e^{2(x-y)} \varphi_1(y) dy$$

**Que.5.** Find the solution of the I.E.

$$\int_0^x \varphi(x-y)[\varphi(y) - 2\sin \alpha y] dy = x \cos \alpha x$$

  
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**Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.**



Section / Batch: Sem I  
 Subject: **I.E.**  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I (Mathematics) Sem - I

Month: **Sept. 2022**  
 Teacher's Name: **Dr. Vidhya Chauhan**

Class  
 Sex

Attendance Sheet

S.N	Name	Total Upto last Month	Periods																				Total	Progressive Month
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
			Att	Date																				
1	Abhishek Yadav																							
2	Amavali Arun Patil																							
3	Ankita Premial Rambhad																							
4	Divya Bandu Ahirkar																							
5	Gunjan Shivprakash Sharma																							
6	Karishma Babulaji Pandhare																							
7	Komal Madantlal Rahangdale																							
8	Lalit Ramchandra Rajgire																							
9	Neha Vinod Manmode																							
10	Prachi Harichandra Meharkule																							
11	Priti Dinesh Patle																							
12	Priya Bimalkumar Maity																							
13	Renu Kishor Patne																							
14	Shubham Shankar Hulke																							
15	Shubhangi Totaramaji Barde																							
16	Sweta Ashok Upase																							
17	Tanushree Devaji Bhujade																							
18	Triupti Arun Akhare																							
19	Darshang Anude																							
20	Sheetal Himpathi																							
21																								
22																								

*Chauhan*

Teacher

*Am*

Head of Department

Principal

( Dr. V. T. Chauhan )

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Nov - Dec - 2022  
 V.T. Chaudhan  
 Teacher's Name

Month  
 Teacher's Name

U-T  
 V-T

Sri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur.  
 M.Sc. I (Mathematics) Sem - I  
 G.V

Seminar  
 2022-2023

Attendance Sheet

S.No	Name	Total Upto last Month	Periods																				Total	Present Month	Progressive Month			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20						
1	Abhishek Yadav	21/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
2	Amavali Arun Patil																											
3	Darshana S. Mude																											
4	Divya Bandu Ahirkar	19/12																										
5	Gupjan Shivprakash Sharma	14/11																										
6	Karishma Babulaji Pandhare																											
7	Lalit Ramchandra Rajgire																											
8	Neha Vinod Manmode																											
9	Prachi Harichandra Meharkule																											
10	Priti Dinesh Patle	14/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
11	Priya Bimalkumar Maity	21/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
12	Renu Kishor Patne																											
13	Sakshi A. Sontakke																											
14	Shrikant L. Tripathi																											
15	Shubham Shankar Hulke																											
16	Shubhangi Totaramji Barde	15/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
17	Sweta Ashok Upase	15/11	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
18	Tanushree Devaji Bhujade																											
19	Trupti Arun Akhare	19/12	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			

*(Signature)*  
 Head of Department

Principal

*(Signature)*  
 Teacher  
 (Dr. V. T. Chaudhan)

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.



Section / Batch: Sem I U-III  
 Subject: I-G / Topology-I  
 Theory / Practical: M.Sc. I (Mathematics) Sem - I

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 2022-2023

Month: Jan-22  
 Teacher's Name: V.T. Chauhan

Total → 78 ded.

S.N	Name	Total Upto last Month	Attendance Sheet																	Total						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		18	19	20			
1	Abhishek Yadav	Deli	01/01	01/01	02/01	03/01	04/01	05/01	06/01	07/01	08/01	09/01	10/01	11/01	12/01	13/01	14/01	15/01	16/01	17/01	18/01	19/01	20/01	70	Present Month	Progressive Month
2	Amavelli Arun Pathi		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		32		
3	Darshana S. Mude		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		34		
4	Divya Bandu Ahirkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		30		
5	Gunjan Shivprakash Sharma		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		30		
6	Karishma Babulaji Pendhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		02		
7	Lalit Ramchandra Rajgire		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		32		
8	Neha Vinod Manmode		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38		
9	Prachi Harichandra Meharkule		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		44		
10	Priti Dinesh Patle		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		46		
11	Priya Bimalkumar Maity		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		30		
12	Renu Kishor Patne		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		12		
13	Sakshi A. Sontakke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		58		
14	Shrikant L. Tripathi		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		48		
15	Shubham Shankar Hulke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		24		
16	Shubhangi Totaramji Barde		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		58		
17	Sweta Ashok Upase		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		48		
18	Tanushree Devaji Bhujade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		24		
19	Trupti Arun Akhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		58		

*Chauhan*

Teacher

*Am*

Head of Department

Principal

(Dr. V. T. Chauhan)

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar  
 INAGF Un.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -II(2022-23)

Paper -I(Algebra II)

Internal Marks

Teacher Name: Chanchal Jain

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	5	3	2	2	12
3		Ku. Darshana S. Mude	6	4	4	4	18
4		Ku. Divya Bandu Ahirkar	5	2	2	2	11
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	5	3	2	3	13
7		Lalit Ramchandra Rajgire	5	2	1	2	10
8		Ku. Neha Vinod Manmode	5	3	2	2	12
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	5	5	25
13		Ku. Sakshi A. Sontakke	4	3	2	2	11
14		Shrikant L. Tripathi	4	3	2	2	11
15		Shubham Shankar Hulke	6	1	2	2	11
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	7	4	1	3	15
18		Ku. Tanushree Devaji Bhujade	10	4	3	4	21
19		Ku. Trupti Arun Akhare	10	5	4	5	25

*eJain*



*Amu*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : SECOND SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

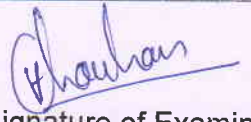
Subject Name : ALGEBRA II

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	578329	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	578330	202010001147281	AMAVALI ARUN PATIL	12
3	578331	2015016601458872	DARSHANA SANJAYRAO MUDE	18
4	578332	202010001147521	DIVYA BANDU AHIRKAR	11
5	578333	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	578334	201730944004613	KARISHMA BABULALJI PANDHARE	13
7	578335	20191011315341	LALIT RAMCHANDRA RAJGIRE	10
8	578336	20201011513593	NEHA VINOD MANMODE	12
9	578337	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	578338	20201056403617	PRITI DINESH PATLE	25
11	578339	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	578340	-	RENU KISHORE PATNE	25
13	578341	20201010012777	SAKSHI ANIL SONTAKKE	11
14	578342	-	SHRIKANT LALJI TRIPATHI	11
15	578343	20191000107444	SHUBHAM SHANKAR HULKE	11
16	578344	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	578345	-	SWETA ASHOK UPASE	15
18	578346	20201011607554	TANUSHREE DEVAJI BHUJADE	21
19	578347	20191011315242	TRUPTI ARUNRAO AKHARE	25

Print Date & Time: 27-06-2023 01:26:28 PM

  
Signature of Examinee

  
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Science College, Congress Nagar,  
NAGPUR.

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Department of Mathematics

M.Sc-I Semester-II  
Paper-I Algebra-II

Unit Test-I

Date: 01<sup>st</sup> Feb. 2023

Duration: 1 Hour ]

[ Max mark: 25 Marks

Attempt Any ONE question

1. (a) If  $R$  is UFD, then show that the factorization of any element in  $R$  as a finite product of irreducible factors is unique to within order and unit factors. 10

(b) Given that  $a, b, c \in R$  and  $R$  is a commutative integral domain with unity, in which g.c.d.  $(a, b)$  exists for each pair :

(i) Show that if  $(a, b) = 1$  and if  $a/c$  and  $b/c$ , then  $ab/c$ .

(ii) Show that if  $(a, b) = 1$  and  $b/ac$  then  $b/c$ . 10

2. (a) Define :

(i) irreducible element

(ii) prime element

(iii) associates

(iv) unique factorization domain.

Show that an irreducible element in a commutative principal ideal domain is always prime. 10

(b) Define a Euclidean Domain. Show that the ring of Gaussian integers  $R = \{m + n\sqrt{-1} ; m, n \in \mathbb{Z}\}$  is a Euclidean domain. 10

(Compulsory)

(a) Form the integral equation corresponding to :

$$y'' + 2xy' + y = 0, y(0) = 1, y'(0) = 0.$$

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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-II)  
Session (2022-23)**

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**Subject: Algebra II  
Assignment**

**Que.1** Let  $P(x)$  be an irreducible polynomial in  $F[x]$  then show that there exists an extension  $E$  of  $F$  in which  $P(x)$  has a root.

**Que.2** Let  $E$  be an algebraic extension of  $F$  and let  $\sigma : E \rightarrow E$  be an embedding of  $E$  into itself over  $F$ , then prove that  $\sigma$  is onto and hence automorphism.

**Que.3** If  $R$  is UFD, then show that the factorization of any element in  $R$  as a finite product of irreducible factor is unique to within order of unit factor.

**Que.4** show that  $x^3 + 3x + 2 \in \mathbb{Z}/(7)[x]$  is irreducible over the field  $\mathbb{Z}/(7)$ .

**Que.5** If  $a$  and  $b$  are constructible number then show that  $a \pm b$  are constructible.

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Science College, Congress Nagar,  
NAGPUR.**

Section / Batch: Sem II  
 Subject: Algebra II  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur

M.Sc. I(Mathematics) Sem - II

Attendance Sheet(2022-2023)

Month: April / May  
 Teacher's Name: chanchal Jain

S.N	Name	Total	Peri	Date																			Total	Current Month	Progressive Month				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20			
1	Abhishek Yadav			11/4	12/4	13/4	14/4	15/4	16/4	17/4	18/4	19/4	20/4	21/4	22/4	23/4	24/4	25/4	26/4	27/4	28/4	29/4	30/4	31/4	1/5	2/5	3/5	4/5	5/5
2	Ku Amavali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Divya Bandu Ahirkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku. Karishma Babulaji Pandhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Lalit Ramchandra Rajgire			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sweta Ashok Upase			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

*Chanchal Jain*

Teacher

*Chanchal Jain*

Head of Department

Principal

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR,

Attendance Sheet(2022-2023)

S.N	Name	Total	Peri																			Total	Current Month	Progressive Month			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20		
1	Abhishek Yadav		8/5	9/5	14/5	4/5	18/5	P	P	P																	
2	Amavali Arun Patil		P	P	P	P	P	P	P																		
3	Ku. Darshana S. Mude		P	P	P	P	P	P	P																		
4	Divya Bandu Ahirkar		-	-	-	-	-	-	-																		
5	Gunjan Shivprakash Sharma		P	P	P	P	P	P	P																		
6	Ku. Karishma Babulaji Pandhare		P	P	P	P	P	P	P																		
7	Lalit Ramchandra Rajgire		P	P	P	P	P	P	P																		
8	Neha Vinod Manmode		P	P	P	P	P	P	P																		
9	Prachi Harichandra Meharkule		P	P	P	P	P	P	P																		
10	Priti Dinesh Patle		P	P	P	P	P	P	P																		
11	Priya Bimalkumar Maity		P	P	P	P	P	P	P																		
12	Renu Kishor Patne		P	P	P	P	P	P	P																		
13	Sakshi A. Sontakke		P	P	P	P	P	P	P																		
14	Shrikant L. Tripathi		P	P	P	P	P	P	P																		
15	Shubham Shankar Hulke		P	P	P	P	P	P	P																		
16	Shubhangi Totaramji Barde		P	P	P	P	P	P	P																		
17	Sweta Ashok Upase		P	P	P	P	P	P	P																		
18	Tanushree Devaji Bhujade		P	P	P	P	P	P	P																		
19	Trupti Arun Akhare		P	P	P	P	P	P	P																		

*ejein*

Teacher

*Chanchal Sam*

Head of Department

Principal

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Department of Mathematics  
Science College

**SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.**

**Department of Mathematics  
M.Sc. I Semester -II (2022-23)  
Paper -II(Real Analysis II)**

**Internal Marks**

**Teacher Name: Sandhya Chauhan**

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	5	3	2	2	12
3		Ku. Darshana S. Mude	7	4	3	4	18
4		Ku. Divya Bandu Ahirkar	5	2	1	3	11
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	6	3	2	4	15
7		Lalit Ramchandra Rajgire	4	2	2	2	10
8		Ku. Neha Vinod Manmode	5	2	2	3	12
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	5	5	25
13		Ku. Sakshi A. Sontakke	5	2	2	2	11
14		Shrikant L. Tripathi	5	2	1	2	10
15		Shubham Shankar Hulke	5	2	2	2	11
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	5	3	2	2	12
18		Ku. Tanushree Devaji Bhujade	9	4	4	4	21
19		Ku. Trupti Arun Akhare	10	5	5	5	25

*Sandhya Chauhan*



*Sandhya Chauhan*  
**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR,**





RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : SECOND SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

Subject Name : REAL ANALYSIS II

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	578329	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	578330	202010001147281	AMAVALI ARUN PATIL	12
3	578331	2015016601458872	DARSHANA SANJAYRAO MUDE	18
4	578332	202010001147521	DIVYA BANDU AHIRKAR	11
5	578333	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	578334	201730944004613	KARISHMA BABULALJI PANDHARE	15
7	578335	20191011315341	LALIT RAMCHANDRA RAJGIRE	10
8	578336	20201011513593	NEHA VINOD MANMODE	12
9	578337	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	578338	20201056403617	PRITI DINESH PATLE	25
11	578339	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	578340	-	RENU KISHORE PATNE	25
13	578341	20201010012777	SAKSHI ANIL SONTAKKE	11
14	578342	-	SHRIKANT LALJI TRIPATHI	10
15	578343	20191000107444	SHUBHAM SHANKAR HULKE	11
16	578344	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	578345	-	SWETA ASHOK UPASE	12
18	578346	20201011607554	TANUSHREE DEVAJI BHUJADE	21
19	578347	20191011315242	TRUPTI ARUNRAO AKHARE	25

*H. Chauhan*

Signature of Examiner

Print Date & Time: 27-06-2023 01:37:11 PM

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Department of Mathematics  
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**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc-I Semester-II  
Paper-I Real Analysis II  
Unit Test-I  
Date: 03<sup>rd</sup> Feb. 2023**

Duration: 1 Hour ]

[ Max mark: 25 Marks

**Attempt Any ONE question**

Unit I

1. (a) . Show that if  $E_1$  and  $E_2$  are measurable then  $E_1 \cup E_2$  is measurable and  $m(E_1 \cup E_2) + m(E_1 \cap E_2) = mE_1 + mE_2$

(10)

(b) Prove that the interval  $(a, \infty)$  is measurable.

(10)

OR

2. (a) Define a measurable function. If  $f$  and  $g$  are measurable functions, then prove that  $f + g$  and  $f \cdot g$  are also measurable.

(10)

(b) Prove that outer measure of an interval is its length

(10)

Compulsory

3. (a) Write Little's theorem

(05)

  
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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-II)  
Session (2022-23)**

---

**Subject: Real Analysis II  
Assignment**

Que. 1. Prove that a function  $F$  is of bounded variation on  $[a,b]$  iff  $F$  is the difference of two monotone real value functions on  $[a,b]$ .

Que.2. State and prove Vitali Convergence Theorem.

Que. 3. State and prove Fatou's Lemma.

Que. 4. Prove that outer measure of an interval is its length.

Que.5. Write Little's hood three principle.

*Shauhan*

  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem II

Subject: REAL Analysis-II

Theory / Practical:

Shri Shivaji Education Society Amravati's

Science College, Congress Nagar, Nagpur

M.Sc. I (Mathematics) Sem - II

Attendance Sheet 2022-2023

Month: - April - 2023

Teacher's Name: SANDHYA CHAUHAN

UNIT-TEST

S.N	Name	Total Upto	Perik Date	Attendance Sheet 2022-2023																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1	Abhishek Yadav			12	13	17	18	19	20	21	24	25	26	27	28	29								
2	Ku Amavali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P									
3	Ku Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P									
4	Ku Divya Bandu Ahirkar																							
5	Ku Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P									
6	Ku Karishma Babulaji Pandhare																							
7	Lalit Ramchandra Rajgire																							
8	Ku Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P									
9	Ku Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P									
10	Ku Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P									
11	Ku Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P									
12	Ku Renu Kishor Patne																							
13	Ku Sakshi A. Sontakke																							
14	Shrikant L. Tripathi																							
15	Shubham Shankar Hulke																							
16	Ku Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P									
17	Ku Sweta Ashok Upase																							
18	Ku Tanushree Devaji Bhujade																							
19	Ku Trupti Arun Akhare																							

Shankar

Teacher

Am

Head of Department

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Department of Mathematics

Science College, Congress Nagar,

NAGPUR.

Principal

Section / \Batch: Sem IV  
 Subject : Real Analysis - II  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. I (Mathematics) Sem - II  
 Attendance Sheet (20 22 - 2023)

Month  
 Teacher's Name

March - 23  
 SANDHYA CHAUDHAN

S.N	Name	Total Upto last Month	Att	Periods													Total	Present Month	Progressive Month									
				1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20		
1	Abhishek Yadav			10	11	13	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
2	Amavali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
3	Ankita Premlal Rambhad						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
4	Divya Bandu Ahirkar						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
5	Gunjan Shivprakash Sharma						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
6	Karishma Babulaji Pandhare						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
7	Komal Madanlal Rahangdale						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
8	Lalit Ramchandra Rajgire						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
9	Neha Vinod Manmode						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
10	Priachi Harichandra Meharkule						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
11	Priti Dinesh Patle						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
12	Priya Bimalkumar Maity						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
13	Renu Kishor Patne						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
14	Shubham Shankar Hulke						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
15	Shubhangi Totaramji Barde						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
16	Sweta Ashok Upase						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
17	Tanushree Devaji Bhujade						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
18	Trupti Arun Akhare						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P					
19																												
20																												
21																												
22																												

(Shubham)  
 Teacher

(Amr)  
 Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -II (2022-23)

Paper -III(Topology II)

Internal Marks

Teacher Name: Dr. Vidya Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	5	3	2	1	11
3		Ku. Darshana S. Mude	9	4	3	3	19
4		Ku. Divya Bandu Ahirkar	5	3	2	1	11
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	7	3	2	2	14
7		Lalit Ramchandra Rajgire	5	2	1	2	10
8		Ku. Neha Vinod Manmode	6	3	2	2	13
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	5	5	25
13		Ku. Sakshi A. Sontakke	6	2	2	1	11
14		Shrikant L. Tripathi	5	2	2	2	11
15		Shubham Shankar Hulke	5	2	2	2	11
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	6	2	2	2	12
18		Ku. Tanushree Devaji Bhujade	10	4	4	5	23
19		Ku. Trupti Arun Akhare	10	5	5	5	25

*Chauhan*



*Asru*  
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Department of Mathematics  
Science College, Congress Nagar  
NAGPUR.



**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**

**Internal Marks Sheet**

**Exam Name : SECOND SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)**

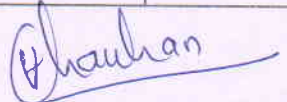
**Subject Name : TOPOLOGY II**


**College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE**

**Session : Summer-2023**

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	578329	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	578330	202010001147281	AMAVALI ARUN PATIL	11
3	578331	2015016601458872	DARSHANA SANJAYRAO MUDE	19
4	578332	202010001147521	DIVYA BANDU AHIRKAR	11
5	578333	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	578334	201730944004613	KARISHMA BABULALJI PANDHARE	14
7	578335	20191011315341	LALIT RAMCHANDRA RAJGIRE	10
8	578336	20201011513593	NEHA VINOD MANMODE	13
9	578337	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	578338	20201056403617	PRITI DINESH PATLE	25
11	578339	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	578340	-	RENU KISHORE PATNE	25
13	578341	20201010012777	SAKSHI ANIL SONTAKKE	11
14	578342	-	SHRIKANT LALJI TRIPATHI	11
15	578343	20191000107444	SHUBHAM SHANKAR HULKE	11
16	578344	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	578345	-	SWETA ASHOK UPASE	12
18	578346	20201011607554	TANUSHREE DEVAJI BHUJADE	23
19	578347	20191011315242	TRUPTI ARUNRAO AKHARE	25

Print Date & Time: 27-06-2023 01-50-01 PM

  
Signature of Examiner

  
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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc-I Semester-II  
Paper-II I Topology II  
Unit Test-I  
Date: 04<sup>th</sup> Feb. 2023**

**Duration: 1 Hour ]**

**[ Max mark: 25 Marks**

**Attempt Any ONE question**

1. (a) State and prove Urysohn's lemma. 14
- (b) Prove that if a metric space has an  $\epsilon$ -net,  $\forall \epsilon > 0$ , then it is bounded. 6
2. (a) Prove that Tichonov space has a topological property. 10
- (b) Prove that a continuous mapping of compact metric space to metric space is uniformly continuous. 10

**COMPULSORY**

- (a) Prove that regular space is not completely regular space by giving example. 5

*Phauhan*

*mm*  
**HEAD**

**Department of Mathematics  
Science College, Congress Nagar,  
Nagpur.**



**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-II)  
Session (2022-23)**

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**Subject: Topology II  
Assignment**

- Que. 1. Prove that the union of collection connected subset of  $X$  that have one point common is connected.
- Que. 2. A topological space  $X$  is connected iff subset of  $X$  that are both open and closed in  $X$  are the empty set and  $X$  only.
- Que. 3. State and prove Intermediate Value Theorem.
- Que. 4. Prove that a path connected set is connected.
- Que. 5. State and prove Urysohn's lemma.

  
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Department of Mathematics  
Science College, Congress Nagar,  
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Section / Batch: Sem II  
 Subject: Topo II  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur

M.Sc. I (Mathematics) Sem - II U.T.I

Attendance Sheet (2022-2023) ↑

Month: April  
 Teacher's Name: Sandhya Chauhan

S.N	Name	Total	Attendance Sheet (2022-2023)												Current Month	Progressive Month									
			Peri	1	2	3	4	5	6	7	8	9	10	11			12	13	14	15	16	17	18	19	20
					12/17/4	17/17/4	19/17/4	21/17/4	23/17/4	25/17/4	27/17/4	29/17/4													
	Deli Att																								
	Date																								
1	Abhishek Yadav		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
2	Amavali Arun Patil		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku. Darshana S. Mude		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Divya Bandu Ahirkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Gunjan Shivprakash Sharma		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku. Karishma Babulaji Pandhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Lalit Ramchandra Rajgire		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Neha Vinod Manmode		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Prachi Harichandra Meharkule		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Priti Dinesh Patle		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Priya Bimalkumar Maity		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Renu Kishor Patne		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Sakshi A. Sontakke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Shrikant L. Tripathi		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Shubham Shankar Hulke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Shubhangi Totaramji Barde		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sweta Ashok Upase		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Tanushree Devaji Bhujade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Trupti Arun Akhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Sandhya Chauhan

Teacher

Head of Department

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Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Principal

Section / \Batch: Sem II  
 Subject : Topo' II  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur

M.Sc. I(Mathematics) Sem - II

Attendance Sheet(2022-2023)

Month: May - 2023  
 Teacher's Name: Sandhya Chauhan

S.N	Name	Total	Perf	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Current Month		Progressive Month	
																								Deli	Att		
1	Abhishek Yadav			P	P	P	P	P	P	P	P	P	P	P	P												
2	Amavali Arun Patil			P	P	P	P	P	P	P	P	P	P	P	P												
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P												
4	Divya Bandu Ahirkar			P	P	P	P	P	P	P	P	P	P	P	P												
5	Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P												
6	Ku. Karishma Babulaji Pandhare			P	P	P	P	P	P	P	P	P	P	P	P												
7	Lalit Ramchandra Rajgire			P	P	P	P	P	P	P	P	P	P	P	P												
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P												
9	Prachi Harichandra Meharkule			P	P	P	P	P	P	P	P	P	P	P	P												
10	Priti Dinesh Patle			P	P	P	P	P	P	P	P	P	P	P	P												
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P												
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P												
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P												
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P												
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P												
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P												
17	Sweta Ashok Upase			P	P	P	P	P	P	P	P	P	P	P	P												
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P												
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P												

Sandhya Chauhan

Teacher

Sandhya Chauhan  
 Head of Department

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Principal

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. I Semester -II (2022-23)  
Paper -IV(Differential Geomentry)

Internal Marks

Teacher Name: Chanchal Jain and Sandya Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	6	4	3	5	18
3		Ku. Darshana S. Mude	10	5	4	5	24
4		Ku. Divya Bandu Ahirkar	10	4	4	5	23
5		Ku. Gunjan Shivprakash Sharma	10	5	4	5	24
6		Ku. Karishma Babulaji Pandhare	10	5	4	5	24
7		Lalit Ramchandra Rajgire	7	4	3	4	18
8		Ku. Neha Vinod Manmode	10	5	4	5	24
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	4	5	24
13		Ku. Sakshi A. Sontakke	6	4	2	4	16
14		Shrikant L. Tripathi	8	3	3	4	18
15		Shubham Shankar Hulke	8	3	3	3	17
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	10	5	5	5	25
18		Ku. Tanushree Devaji Bhujade	10	5	4	5	24
19		Ku. Trupti Arun Akhare	10	5	4	5	24

*Shauhan*



*ASM*  
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Department of Mathematics  
Science College, Congress Nagar  
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RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : SECOND SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

Subject Name : DIFFERENTIAL GEOMETRY

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	578329	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	578330	202010001147281	AMAVALI ARUN PATIL	12
3	578331	2015016601458872	DARSHANA SANJAYRAO MUDE	18
4	578332	202010001147521	DIVYA BANDU AHIRKAR	11
5	578333	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	578334	201730944004613	KARISHMA BABULALJI PANDHARE	12
7	578335	20191011315341	LALIT RAMCHANDRA RAJGIRE	11
8	578336	20201011513593	NEHA VINOD MANMODE	12
9	578337	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	578338	20201056403617	PRITI DINESH PATLE	25
11	578339	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	578340	-	RENU KISHORE PATNE	25
13	578341	20201010012777	SAKSHI ANIL SONTAKKE	11
14	578342	-	SHRIKANT LALJI TRIPATHI	11
15	578343	20191000107444	SHUBHAM SHANKAR HULKE	11
16	578344	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	578345	-	SWETA ASHOK UPASE	15
18	578346	20201011607554	TANUSHREE DEVAJI BHUJADE	21
19	578347	20191011315242	TRUPTI ARUNRAO AKHARE	25

*Shauhan*

Signature of Examiner

Print Date & Time: 27-06-2023 01:48:34 PM

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**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc-I Semester-II  
Paper-IV Differential Geometry  
Unit Test-I  
Date: 06<sup>th</sup> Feb . 2023**

Duration: 1 Hour ]

[ Max mark: 25 Marks

**Attempt Any ONE question**

Unit I


1. (a) Show that the position vector of any point on the surface of revolution generated by the curve  $x = g(u), y = 0, z = f(u)$  in XOY plane is  $r = (g(u)\cos v, g(u)\sin v, f(u))$ , where  $v$  is the angle of rotation. (10)
- (b) Calculate the first fundamental coefficient and the area of anchor ring corresponding to the domain  $0 \leq u \leq 2\pi$  and  $0 \leq v \leq 2\pi$  (10)

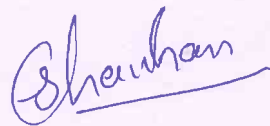
OR

2. (a) Find the coefficient of the direction makes an angle  $\pi/2$  with direction whose coefficient are  $(l, m)$ . (10)
- (b) Derive the differential equation of geodesic. (10)

Compulsory

3. (a) Show that proper parametric transformation either leaves every normal unchanged or reversed the direction of the normal. (05)

  
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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-II)  
Session (2022-23)**

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**Subject: Differential Geometry  
Assignment**

Que.1. Prove that the geodesic curvature of a curve on a surface is zero if and only if it is a geodesic on the surface.

Que.2 . Define Gaussian curvature and total curvature of a given surface. State Gauss- Bonnet theorem.

Que.3. Prove that a characteristic property of a geodesic is that at every point its Principal normal is normal to the surface. Show also every curve having this property is a geodesic.

Que.4. Prove that if there is a surface of minimum area passing through a closed space curve, then it is necessarily a minimal surface.

  
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Section / Batch: Sem II

Subject: D.67

Theory / Practical :

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

M.Sc. I(Mathematics) Sem - II

Attendance Sheet(2022-2023)

Month: April / May  
Teacher's Name: Chanchal Jain / Sandhya Chauhan

S.N	Name	Total	Period																			Total	Current Month	Progressive Month	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				20
1	Abhishek Yadav		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P				
2	Amavali Arun Patil		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
3	Ku. Darshana S. Mude		P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
4	Divya Bandu Ahirkar		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
5	Gunjan Shivprakash Sharma		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
6	Ku. Karishma Babulaji Pandhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
7	Lalit Ramchandra Rajgire		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
8	Neha Vinod Manmode		P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
9	Prachi Harichandra Meharkule		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
10	Priti Dinesh Patle		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
11	Priya Bimalkumar Maity		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
12	Renu Kishor Patne		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
13	Sakshi A. Sontakke		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
14	Shrikant L. Tripathi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
15	Shubham Shankar Hulke		P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
16	Shubhangi Totaramji Barde		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
17	Sweta Ashok Upase		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
18	Tanushree Devaji Bhujade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
19	Trupti Arun Akhare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			

Sandhya Chauhan

Teacher

Chanchal Jain

Head of Department

Principal

HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



Subject : D.U  
Theory / Practical :

Science College, Congress Nagar, Nagpur  
M.Sc. I (Mathematics) Sem - II

Teacher's Name: chanchal / chauhan

Attendance Sheet (2022-2023)

S.N	Name	Total	Perf							12	13	14	15	16	17	18	19	20	Total	Current Month	Progressive Month	
			1	2	3	4	5	6	7													8
1	Abhishek Yadav		8/5	P	P	P	P	P	P													
2	Ku Amavali Arun Patil		9/5	P	P	P	P	P	P													
3	Ku. Darshana S. Mude		10/5	P	P	P	P	P	P													
4	Ku Divya Bandu Ahirkar		11/5	P	P	P	P	P	P													
5	Ku Gunjan Shivprakash Sharma		12/5	P	P	P	P	P	P													
6	Ku. Karishma Babulaji Pandhare		13/5	P	P	P	P	P	P													
7	Lalit Ramchandra Rajgire		14/5	P	P	P	P	P	P													
8	Ku Neha Vinod Manmode		15/5	P	P	P	P	P	P													
9	Ku Prachi Harichandra Meharkule		16/5	P	P	P	P	P	P													
10	Priti Dinesh Patle		17/5	P	P	P	P	P	P													
11	Ku Priya Bimalkumar Maity		18/5	P	P	P	P	P	P													
12	Ku Renu Kishor Patne		19/5	P	P	P	P	P	P													
13	Ku Sakshi A. Sontakke		20/5	P	P	P	P	P	P													
14	Ku Shrikant L. Tripathi		21/5	P	P	P	P	P	P													
15	Ku Shubham Shankar Hulke		22/5	P	P	P	P	P	P													
16	Ku Shubhangi Totaramji Barde		23/5	P	P	P	P	P	P													
17	Ku Sweta Ashok Upase		24/5	P	P	P	P	P	P													
18	Ku Tanushree Devaji Bhujade		25/5	P	P	P	P	P	P													
19	Ku Trupti Arun Akhare		26/5	P	P	P	P	P	P													

*Shauhan*

Teacher

*Amu*

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Principal

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Department of Mathematics  
Science College, Congress Nagar,  
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SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics

M.Sc. I Semester -II (2022-23)

Paper -V(Classical Mechanics)

Internal Marks

Teacher Name: Vidya Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Abhishek Yadav	10	5	5	5	25
2		Ku. Amavali Arun Patil	4	3	2	2	11
3		Ku. Darshana S. Mude	9	3	3	3	18
4		Ku. Divya Bandu Ahirkar	5	3	2	1	11
5		Ku. Gunjan Shivprakash Sharma	10	5	5	5	25
6		Ku. Karishma Babulaji Pandhare	5	3	2	3	13
7		Lalit Ramchandra Rajgire	4	2	2	2	10
8		Ku. Neha Vinod Manmode	5	2	2	3	12
9		Ku. Prachi Harichandra Meharkule	10	5	5	5	25
10		Ku. Priti Dinesh Patle	10	5	5	5	25
11		Ku. Priya Bimalkumar Maity	10	5	5	5	25
12		Ku. Renu Kishor Patne	10	5	5	5	25
13		Ku. Sakshi A. Sontakke	5	2	2	2	11
14		Shrikant L. Tripathi	5	2	2	2	11
15		Shubham Shankar Hulke	5	2	2	2	11
16		Ku. Shubhangi Totaramji Barde	10	5	5	5	25
17		Ku. Sweta Ashok Upase	6	2	2	5	15
18		Ku. Tanushree Devaji Bhujade	9	4	4	4	21
19		Ku. Trupti Arun Akhare	10	5	5	5	25



*Vidya Chauhan*  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : SECOND SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

Subject Name : CLASSICAL MECHANICS

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	578329	20201010012888	ABHISHEK AJAY KUMAR YADAV	25
2	578330	202010001147281	AMAVALI ARUN PATIL	11
3	578331	2015016601458872	DARSHANA SANJAYRAO MUDE	18
4	578332	202010001147521	DIVYA BANDU AHIRKAR	11
5	578333	20201055210451	GUNJAN SHIVPRAKASH SHARMA	25
6	578334	201730944004613	KARISHMA BABULALJI PANDHARE	13
7	578335	20191011315341	LALIT RAMCHANDRA RAJGIRE	10
8	578336	20201011513593	NEHA VINOD MANMODE	12
9	578337	20201010012730	PRACHI HARICHANDRA MEHARKULE	25
10	578338	20201056403617	PRITI DINESH PATLE	25
11	578339	20201010012746	PRIYA BIMALKUMAR MAITY	25
12	578340	-	RENU KISHORE PATNE	25
13	578341	20201010012777	SAKSHI ANIL SONTAKKE	11
14	578342	-	SHRIKANT LALJI TRIPATHI	11
15	578343	20191000107444	SHUBHAM SHANKAR HULKE	11
16	578344	191040776	SHUBHANGI TOTARAMJI BARDE	25
17	578345	-	SWETA ASHOK UPASE	15
18	578346	20201011607554	TANUSHREE DEVAJI BHUJADE	21
19	578347	20191011315242	TRUPTI ARUNRAO AKHARE	25

*Chauhan*

Signature of Examiner

Print Date & Time: 27-06-2023 01:52:05 PM

*Amo*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
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**Science College, Congress Nagar, Nagpur**

**Department of Mathematics**

**M.Sc-I Semester-II**

**Paper-V Classical Mechanics**

**Unit Test-I**

**Date: 07<sup>th</sup> Feb. 2023**

**Duration: 1 Hour ]**

**[ Max mark: 25 Marks**

**Attempt Any ONE question**

**UNIT—I**

1. (a) Derive Euler's Lagrange's differential equation by using variational principle. 10
- (b) Show that Hamilton's principle can be extended to non holonomic system. By using the method of Lagrange's undermined multipliers, obtain Lagrange's equations for non-holonomic systems. 10
2. (a) Discuss rolling without slipping of a hoop down an inclined plane using Lagrange's multiplier. 10
- (b) Find the shortest distance between two points A and B in a plane by using polar coordinates. 10

**(Compulsory)**

- (a) If a generalized coordinate does not appear in  $H$ , then show that the corresponding conjugate momentum is conserved. 5

*Phauhan*

*Amu*

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**Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.**

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc.-I(Sem-II)  
Session (2022-23)**

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**Subject: Classical Mechanics  
Assignment**

Que.1. Find the extremals of the functional:

$$I[y(x)] = \int_0^{2\pi} (y'^2 - y^2) dx, \quad y(0) = 1, y(2\pi) = 1$$

Que.2. Derive the extension of Hamilton's principle to non-conservative holonomic system.

Que.3. Determine the Routhian of the system which has the Lagrangian


$$L = A(\dot{\theta}^2 + \dot{\phi}^2 \sin^2 \theta + B(\dot{\psi} + \dot{\phi} \cos \theta)^2 - V(\theta, \phi)$$

Where A and B are constants & V is the potential energy depending on  $\theta$  and  $\phi$

Que.4. Prove that the Poisson bracket of two constants of motion is itself a constant of motion.

Que.5. State and prove Poisson Theorem

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**Department of Mathematics,**  
**Science College, Congress Nagar,**  
**NAGPUR.**

Section / Batch: Sem II

Shri Shivaji Education Society Amravati's

Month: April - 2023

Subject : Classical mechanics

Science College, Congress Nagar, Nagpur

Teacher's Name: Dr. V. T. Pachhaubay

Theory / Practical :

M.Sc. I (Mathematics) Sem - II

Attendance Sheet (2022-2023)

S.N	Name	Total	Peri date	Date																	Current Month	Progressive Month				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			18	19	20	Total
1	Abhishek Yadav			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
2	Amavali Arun Patil			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	Ku. Darshana S. Mude			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
4	Divya Bandu Ahirkar			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
5	Gunjan Shivprakash Sharma			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
6	Ku. Karishma Babulaji Pandhare			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
7	Lalit Ramchandra Rajgire			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
8	Neha Vinod Manmode			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
9	Prachi Harichandra Meharkule			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
10	Priti Dinesh Patle			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
11	Priya Bimalkumar Maity			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
12	Renu Kishor Patne			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
13	Sakshi A. Sontakke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
14	Shrikant L. Tripathi			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
15	Shubham Shankar Hulke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
16	Shubhangi Totaramji Barde			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
17	Sweta Ashok Upase			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
18	Tanushree Devaji Bhujade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
19	Trupti Arun Akhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		

Shankar

Teacher

Head of Department

Principal

Dr. V. T. Pachhaubay  
Science College, Congress Nagar,  
Amravati, Maharashtra

Section / \Batch: Sem II

Subject: *Classical mechanics*

Theory / Practical :

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

M.Sc. I(Mathematics) Sem - II

Attendance Sheet(2022-2023)

Month: *May-2024*

Teacher's Name: *Pooja V. T. Chauhan*

S.N	Name	Total		Peri Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Current Month		Progressive Month		
		Deli	Att																										
1	Abhishek Yadav				<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>9/5</i>	<i>17/5</i>	<i>17/5</i>	<i>17/5</i>														
2	Ku Amavali Arun Patil				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
3	Ku. Darshana S. Mude				<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>														
4	Ku Divya Bandu Ahirkar				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
5	Ku Gunjan Shivprakash Sharma				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
6	Ku. Karishma Babulaji Pandhare				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
7	Lalit Ramchandra Rajgire				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
8	Ku Neha Vinod Manmode				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
9	Ku Prachi Harichandra Meharkule				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
10	Priti Dinesh Patle				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
11	Ku Priya Bimalkumar Maity				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
12	Ku Renu Kishor Patne				<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>														
13	Ku Sakshi A. Sontakke				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
14	Shrikant L. Tripathi				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
15	Shubham Shankar Hulke				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
16	Ku Shubhangi Totaramji Barde				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
17	Ku Sweta Ashok Upase				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
18	Ku Tanushree Devaji Bhujade				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														
19	Ku Trupti Arun Akhare				<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>														

*Shauhan*

Teacher

*Shauhan*  
Head of Department

Principal

**HEAD**  
Department of Mathematics  
Science College, Congress Nagar,  
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SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -III(2022-23)  
Paper -I(Complex Analysis)

Internal Marks

Teacher Name: Chanchal Jain

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	7	3	2	3	15
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	4	4	5	23
4		Ashish J. Gore	5	2	2	2	11
5		Dewanshish S. Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	10	2	1	2	15
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	1	2	10
11		Pooja G. Balapure	9	5	4	4	22
12		Prachi P. Khotele	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lilhare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	6	4	2	3	15
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	4	5	25
20		Tanaya R. Kalewar	10	5	2	3	20
21		Tasleem Sheikh	10	5	2	3	20
22		Vaishnavi Vaidya	9	5	5	5	24
23		Yamini R. Borkar	10	5	5	5	25

*Chanchal Jain*



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RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : THIRD SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)


Subject Name : COMPLEX ANALYSIS

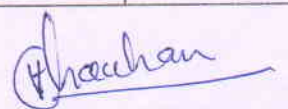
College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	735812	2021016600579393	AMISHA BHASKAR WAGHADE	15
2	735813	2021016600567144	ANUJA MORESHWAR KALSE	25
3	735814	2021016600696477	ASAWARI ANILRAO DESHMUKH	23
4	735815	2021016600731804	ASHISH JANARDHAN GORE	11
5	735816	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	735817	2021016600693661	JYOTI BRIJLAL BIEN	25
7	735818	2021016600737097	KRUTIK SHESHRAO BHONGADE	15
8	735819	2021016600692561	KUNDA JAGANNATH PARATE	25
9	735820	2021016600598235	LILHARE RESHMA ISHWAR	25
10	735821	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	735822	2021016600579385	MINAL SANJAY MESHARAM	10
12	735823	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	735824	2021016600692576	POOJA GAJANAN BALAPURE	22
14	735825	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	735826	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	735827	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	735828	2021016600737147	SUMEDH NARESH RAMTEKE	15
18	735829	2021016600696493	SUPRIYA SUDESH POHARE	25
19	735830	2021016600565996	SURAJ SHARAD BANTE	25
20	735831	2021016600692545	TANAYA RAJU KALEWAR	20
21	735832	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
22	735833	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	24
23	735834	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 08-02-2023 02-01-51 PM

  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's**  
**Science College, Congress Nagar, Nagpur**  
**Department of Mathematics**  
**M.Sc II Semester III**  
**Paper-I Complex Analysis**  
**Unit Test-I**  
Date: 1<sup>st</sup> Sep 2022

Duration : 1 Hour ]

[Max mark: 25 Marks

**Attempt Any ONE questions**

1. (a) Explain, in detail the process of stereographic projection which identifies unit Sphere  $S$  in  $R^3$  with extended complex numbers system  $C_\infty$ . (10)
- (b) State and prove Chain Rule for Analytic functions. (10)

**OR**

2. (a) Let  $u$  and  $v$  be real-valued functions defined on a region  $G$  and suppose that  $u$  and  $v$  have continuous partial derivatives. Then show that  $f : G \rightarrow C$  defined by  $f(z) = u(z) + iv(z)$  is analytic iff  $u$  and  $v$  satisfy the Cauchy-Riemann equations. (10)
  - 3 (b) Prove that a branch of the logarithm function is analytic and its derivative is (10)
- (10)

**Compulsory Questions**

3. (a) If  $G$  is open and connected and  $f : G \rightarrow C$  is differentiable with  $f'(z) = 0$  for all  $z$  in  $G$ , then show that  $f$  is constant  
Let  $G$  be either the whole plane  $C$  or some open disk. If  $u : G \rightarrow R$  is a harmonic function, then show that  $u$  has a harmonic conjugate. (05) (05)

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**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**Amravati, C.S.**

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-III)  
Session(2022-2023)**

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**Subject: Complex Analysis  
Assignment**

Que.1. State and prove Lowville's theorem.


Que.2. If  $G$  is a region and  $f: G \rightarrow \mathbb{C}$  is an analytic function such that there is a point  $a$  in  $G$  with  $|f(a)| \geq |f(z)|$  for all  $z$  in  $G$ , then show that  $f$  is constant.

Que.3. State and proved chain rule for analytic function.

Que. 4. Explain in details the process of stereographic projection which identifies unit sphere  $S$  in  $\mathbb{R}^3$  with extended complex number systems  $\mathbb{C}_\infty$ .

Que.5. Let  $u$  and  $v$  real valued function define on a region  $G$  and suppose that  $u$  and  $v$  have continuous partial derivatives' then show that  $f: G \rightarrow \mathbb{C}$  Define by  $f(z) = u(z) + iv(z)$

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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem III  
 Subject : C.A.  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month **Nov/Dec**  
 Teacher's Name **Chanchal Jain**

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1	Ku Amisha B. Waghade			7/11	9/11	10/11	17/11	14/11	16/11	17/11	21/11	23/11	08/12	9/12	10/12	13/12	14/12	15/12	17/12	18/12	19/12	20/12	17/12	
2	Ku Anuja M. Kalse																							
3	Ku Asawari A. Deshmukh																							
4	Ashish J. Gore																							
5	Dewanshish S. Tumdam																							
6	Ku Jyoti B. Bisen																							
7	Krutik S. Bhongade																							
8	Ku Kunda J. Parate																							
9	Ku Mayuri G. Deshmukh																							
10	Ku Minal S. Meshram																							
11	Ku Pooja G. Balapure																							
12	Ku Prachi P. Khotete																							
13	Ku Rasika D. Bawankar																							
14	Ku Reshma I. Lihare																							
15	Ku shruti M. More																							
16	Ku Sruthi V. Bangalkar																							
17	Sumedh R. Ramteke																							
18	Ku Supriya S. Pohare																							
19	Suraj S. Bante																							
20	Ku. Tanaya R. Kalewar																							
21	Ku. Tasleem Sheikh																							
22	Ku Vaishnavi Vaidya																							
23	Ku Vrushali D. Lokhande																							
24	Ku Yamini R. Borkar																							

*Chanchal Jain*

Teacher:

*Chanchal Jain*

Head of Department:

HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / \Batch: Sem III  
 Subject : CA  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month  
 Teacher's Name

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			19/12	20/12	21/12	22/12	23/12	24/12	27/12	28/12	29/12	31/12	1/1	2/1	9/1	11/1	17/1	18/1	19/1	14/1	13/1			
2	Ku Anuja M. Kaise			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*etm*  
Teacher

Head of Department

*Principa*  
Head

Principa

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / Batch: Sem III  
 Subject: CA  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month: January  
 Teacher's Name: Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade		19%	20%																				
2	Ku Anuja M. Kalse		P	P																				
3	Ku Asawari A. Deshmukh		P	P																				
4	Ashish J. Gore		P	P																				
5	Dewanshish S. Tumdam		P	P																				
6	Ku Jyoti B. Bisen		P	P																				
7	Krutik S. Bhongade		P	P																				
8	Ku Kunda J. Parate		P	P																				
9	Ku Mayuri G. Deshmukh		P	P																				
10	Ku Minal S. Meshram		P	P																				
11	Ku Pooja G. Balapure		P	P																				
12	Ku Prachi P. Khotale		P	P																				
13	Ku Rasika D. Bawankar		P	P																				
14	Ku Reshma I. Lihare		P	P																				
15	Ku shruti M. More		P	P																				
16	Ku Sruthi V. Bangalkar		P	P																				
17	Sumedh R. Ramteke		P	P																				
18	Ku Supriya S. Pohare		P	P																				
19	Suraj S. Bante		P	P																				
20	Ku. Tanaya R. Kalewar		P	P																				
21	Ku. Tasieem Sheikh		P	P																				
22	Ku Vaishnavi Vaidya		P	P																				
23	Ku Vrushali D. Lokhande		P	P																				
24	Ku Yamini R. Borkar		P	P																				

eJain  
 Teacher

*[Signature]*  
 Head of Department

Principal

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -III(2022-23)  
Paper -II Functional Analysis)

Internal Marks

Teacher Name: Ajay Morya

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	7	3	2	3	15
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	3	5	23
4		Ashish J. Gore	5	2	2	2	11
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	10	2	1	2	15
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	1	2	10
11		Pooja G. Balapure	10	5	3	5	23
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lilhare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	7	4	1	3	15
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	8	4	4	4	20
21		Tasleem Sheikh	7	5	4	4	20
22		Vaishnavi Vaidya	9	5	5	5	24
23		Yamini R. Borkar	10	5	5	5	25

*Ashish J. Gore*



*Ajay Morya*  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : THIRD SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

Subject Name : FUNCTIONAL ANALYSIS

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	735812	2021016600579393	AMISHA BHASKAR WAGHADE	15
2	735813	2021016600567144	ANUJA MORESHWAR KALSE	25
3	735814	2021016600696477	ASAWARI ANILRAO DESHMUKH	23
4	735815	2021016600731804	ASHISH JANARDHAN GORE	11
5	735816	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	735817	2021016600693661	JYOTI BRIJLAL BISEN	25
7	735818	2021016600737097	KRUTIK SHESHRAO BHONGADE	15
8	735819	2021016600692561	KUNDA JAGANNATH PARATE	25
9	735820	2021016600598235	LILHARE RESHMA ISHWAR	25
10	735821	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	735822	2021016600579385	MINAL SANJAY MESHRAM	10
12	735823	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	735824	2021016600692576	POOJA GAJANAN BALAPURE	23
14	735825	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	735826	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	735827	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	735828	2021016600737147	SUMEDH NARESH RAMTEKE	15
18	735829	2021016600696493	SUPRIYA SUDESH POHARE	25
19	735830	2021016600565996	SURAJ SHARAD BANTE	25
20	735831	2021016600692545	TANAYA RAJU KALEWAR	20
21	735832	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
22	735833	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	24
23	735834	2021016600696504	YAMINI RAJU BORKAR	25

HEAD

Department of Mathematics  
Science College, Congress Nagar  
NAGPUR.

Signature of Examiner



**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc II Semester III  
Paper-II Functional Analysis  
Unit Test-I**

Date: 02<sup>nd</sup> Sept. 2022

Duration : 1 Hour ]

[Max mark: 25 Marks

Attempt Any ONE questions

1. (a) Let  $X$  and  $Y$  be vector spaces and let  $T : D(T) \rightarrow Y$  be a linear operator,  $D(T) \subseteq X$ ,  $R(T) \subseteq Y$ , then prove that :  
 $T^{-1} : R(T) \rightarrow D(T)$  exists iff Null space of  $T$  is zero and  $T^{-1}$  is a Linear operator. 10
- (b) Prove that a finite dimensional subspace of a normed space is compact iff it is closed and bounded. 10
- OR
2. (a) Define seminorm on a vector space  $X$ . Prove that if  $P$  is a seminorm on a vector space  $X$  then Null space of  $P$ ,  $N(P)$  is subspace of  $X$  and  $P$  is a norm on quotient space  $X/N$ . 10
- (b) Let  $T : D(T) \rightarrow Y$  be a linear operator,  $D(T) \subseteq X$ ,  $X$  and  $Y$  are normed space. Prove that  $T$  is continuous iff  $T$  is bounded on  $X$ . 10

**(COMPULSORY)**

3. Let  $X$  and  $Y$  be metric spaces and  $T : X \rightarrow Y$ , a continuous mapping, prove that if  $M$  is a compact set in  $X$ , then  $T(M)$  is a compact set in  $Y$ . 05

*efem*

  
**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR,**

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-III)  
Session(2022-2023)**

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**Subject: Functional Analysis  
Assignment**

Que. 1. Prove that Dual space  $X'$  of norm space  $X$  is complete.

Que. 2. Let  $Y$  be a subspace of Hilbert space  $H$ , Prove that  $Y$  is Close iff  $Y = Y''$

Que. 3. Prove that the Projection on a Hilbert space  $H$  is bounded linear operator .

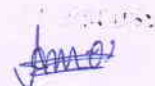
Que. 4. State and prove that a Parallelogram law for Norm space. Further discuss Gram-Schmidt process to obtain an orthonormal set in a vector space.

Que. 5. Prove that a finite dimensional sub space of norm space is compact iff it is closed and bounded.

  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

  
Jain

  
Jain

11/11/2023

Section / Batch: Sem III  
 Subject : FA  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month November  
 Teacher's Name Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			7/11	9/11	10/11	12/11	14/11	15/11	16/11	17/11	21/11	22/11	23/11											
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P											
3	Ku Aswari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P											
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P											
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P											
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P											
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P											
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P											
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P											
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P											
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P											
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P											
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P											
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P											
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P											
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P											
17	Sumadh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P											
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P											
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P											
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P											
21	Ku. Taseem Sheikh			P	P	P	P	P	P	P	P	P	P	P											
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P											
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P											
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P											

*Jain*

Teacher:

*[Signature]*  
 Head of Department  
 HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / \Batch: Sem III  
 Subject: F.A.  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month December  
 Teacher's Name Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1 Ku	Amisha B. Waghade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2 Ku	Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3 Ku	Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6 Ku	Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8 Ku	Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9 Ku	Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10 Ku	Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11 Ku	Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12 Ku	Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13 Ku	Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14 Ku	Reshma I. Lilhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15 Ku	shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16 Ku	Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18 Ku	Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20 Ku	Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21 Ku	Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22 Ku	Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23 Ku	Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24 Ku	Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chanchal Jain*  
 Teacher

*Chanchal Jain*  
 Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 M.C.F.U.

Section / Batch: Sem III  
 Subject: P.A.  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month: January  
 Teacher's Name: Chanch Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																	Total						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		18	19	20			
1 Ku	Amisha B. Waghade		P	P	9/10	P	P	10/10	P	P	12/10	P	P	13/10	P	P	14/10	P	P	14/10	P	P	18/10	P	P	20/10
2 Ku	Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3 Ku	Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6 Ku	Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8 Ku	Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9 Ku	Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10 Ku	Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11 Ku	Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12 Ku	Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13 Ku	Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14 Ku	Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15 Ku	shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16 Ku	Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sumadh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18 Ku	Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20 Ku	Tadaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21 Ku	Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22 Ku	Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23 Ku	Vaishali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24 Ku	Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

*efem*

Teacher

*Amu*

Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -III(2022-23)  
Paper -III(Mathematical Method)

Internal Marks

Teacher Name: Ajay Morya

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	7	3	2	3	15
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	4	4	23
4		Ashish J. Gore	5	2	2	2	11
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	6	3	3	3	15
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	3	3	1	3	10
11		Pooja G. Balapure	10	5	5	3	23
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lihare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	7	4	1	3	15
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	8	4	3	5	20
21		Tasleem Sheikh	8	4	3	5	20
22		Vaishnavi Vaidya	10	5	4	5	24
23		Yamini R. Borkar	10	5	5	5	25

*Amaravati*



*Ajay Morya*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : THIRD SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)


Subject Name : METHEMATICAL METHODS

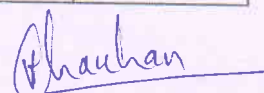
College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	735812	2021016600579393	AMISHA BHASKAR WAGHADE	15
2	735813	2021016600567144	ANUJA MORESHWAR KALSE	25
3	735814	2021016600696477	ASAWARI ANILRAO DESHMUKH	23
4	735815	2021016600731804	ASHISH JANARDHAN GORE	11
5	735816	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	735817	2021016600693661	JYOTI BRIJLAL BISEN	25
7	735818	2021016600737097	KRUTIK SHESHRAO BHONGADE	15
8	735819	2021016600692561	KUNDA JAGANNATH PARATE	25
9	735820	2021016600598235	LILHARE RESHMA ISHWAR	25
10	735821	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	735822	2021016600579385	MINAL SANJAY MESHARAM	10
12	735823	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	735824	2021016600692576	POOJA GAJANAN BALAPURE	23
14	735825	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	735826	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	735827	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	735828	2021016600737147	SUMEDH NARESH RAMTEKE	15
18	735829	2021016600696493	SUPRIYA SUDESH POHARE	25
19	735830	2021016600565996	SURAJ SHARAD BANTE	25
20	735831	2021016600692545	TANAYA RAJU KALEWAR	20
21	735832	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
22	735833	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	24
23	735834	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 08-02-2023 02-11-50 PM

  
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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc II Semester III  
Paper- Mathematical Method  
Unit Test-I  
Date: 04<sup>th</sup> Sept. 2022**

**Duration : 1 Hour ]**

**[Max mark: 25 Marks**

**Attempt Any ONE question**

1. (a) State and prove Localization Lemma.

(10)

- (b) Find Fourier sine and cosine transform of  $e^{-at}$  and hence show that :

$$F_s[t^{-1}e^{at}] = \sqrt{\frac{2}{\pi}} \cot^{-1}\left(\frac{a}{\xi}\right), a > 0$$

(10)

OR

2. (a) Show that  $f_c[e^{-at}, \xi] = \sqrt{\frac{2}{\pi}} \frac{a}{[a^2 + \xi^2]}$  and  $f_s[e^{-at}, \xi] = \sqrt{\frac{2}{\pi}} \frac{\xi}{[a^2 + \xi^2]}$ .

(10)

- (b) State and prove Fouries Integral theorem.

(10)

Compulsory

3. (a) Derive Change of scale property of Fourier Transform.

(05)

*Amravati*

  
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**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR.**



**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-III)  
Session(2022-2023)**

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**Subject: Mathematical Method  
Assignment**

Que. 1. State and prove Parseval's theorem for Cosine Transform.

Que. 2. Solve Laplace Equation  $\Delta_2 u(x,y) = 0$  ;  $0 \leq y \leq a$  with boundary condition  $u(x,0) = f(x)$ ,  $x \geq 0$  and  $u_x(0,y) = 0$  ;  $u_y(x,a) = 0$

Que. 3. Find the finite fourier Sine Transform of

i)  $f(x) = \frac{x}{\pi}$  ,  $0 < x < \pi$

ii)  $f(x) = \cos kx$  ,  $0 < x < \pi$

Que. 4. Using Finite Hankel Transform of second kind, solve the


Differential Equation  $\frac{\partial^2 \theta}{\partial r^2} + \frac{1}{r} \frac{\partial \theta}{\partial r} = \frac{1}{k} \frac{\partial \theta}{\partial t}$  ,  $t \geq 0$  ,  $0 \leq r \leq a$

Satisfying the boundary condition  $\frac{\partial \theta(a,t)}{\partial r} + h\theta(a,t) = 0$  ,  $t \geq 0$

and initial condition ,  $\theta(r, 0) = f(r)$  ,  $0 \leq r \leq a$

Que. 5. By using definition of Convolution Integral, prove that

$f.(g.h) = (f.g).h$

  
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Section / Batch: Sem III  
 Subject: M.M  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month Nov  
 Teacher's Name

Dec.  
Ajay Maurya

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods												Total										
			1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20		
1	Ku Amisha B. Waghade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	Ku. Iasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Amo...

Teacher

Amo...  
 Head of Department

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Principal

Month : December / January  
 Teacher's Name : Ajay Maurya

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Section / Batch: Sem III  
 Subject : M.M.  
 Theory / Practical :

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			19/12	20/12	21/12	22/12	23/12	24/12	25/12	26/12	27/12	28/12	29/12	30/12	31/12	1/1	2/1	3/1	4/1	5/1	6/1	7/1	8/1	9/1
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	Ku. Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

*Amosayya*  
 Teacher

*[Signature]*  
 Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NACFOR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -III(2022-23)  
Paper -IV(General Relativity)

Internal Marks

Teacher Name: Dr. V.T. Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	5	5	5	15
2		Anuja M. Kalse	5	3	2	2	15
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	5	2	2	2	11
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	5	2	1	2	18
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	2	5	1	2	10
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotete	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lilhare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	7	4	1	3	15
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	9	5	3	5	22
21		Tasleem Sheikh	7	5	3	5	20
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Chauhan*



*[Signature]*  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : THIRD SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

Subject Name : GENERAL RELATIVITY

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	735812	2021016600579393	AMISHA BHASKAR WAGHADE	15
2	735813	2021016600567144	ANUJA MORESHWAR KALSE	25
3	735814	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	735815	2021016600731804	ASHISH JANARDHAN GORE	11
5	735816	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	735817	2021016600693661	JYOTI BRIJLAL BIEN	25
7	735818	2021016600737097	KRUTIK SHESHRAO BHONGADE	18
8	735819	2021016600692561	KUNDA JAGANNATH PARATE	25
9	735820	2021016600598235	LILHARE RESHMA ISHWAR	25
10	735821	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	735822	2021016600579385	MINAL SANJAY MESHRAM	10
12	735823	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	735824	2021016600692576	POOJA GAJANAN BALAPURE	25
14	735825	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	735826	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	735827	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	735828	2021016600737147	SUMEDH NARESH RAMTEKE	15
18	735829	2021016600696493	SUPRIYA SUDESH POHARE	25
19	735830	2021016600565996	SURAJ SHARAD BANTE	25
20	735831	2021016600692545	TANAYA RAJU KALEWAR	22
21	735832	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
22	735833	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	735834	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 08-02-2023 02-02-58 PM

*Am*  
**HEAD**  
Department of Mathematics  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

*Phauhan*  
Signature of Examiner

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc II Semester III  
Paper- General Relativity  
Unit Test-I  
Date: 05<sup>th</sup> Sept. 2022**


Duration : 1 Hour ]

[Max mark: 25 Marks

**Attempt Any ONE question**

1. (a) Prove that christoffel's symbols are not tensor. 10  
(b) State and prove Bianchi Identity. 10
  2. (a) Prove the following Identities :  
(i)  $R_{hijk} = -R_{ihjk}$   
(ii)  $R_{hijk} = -R_{hikj}$   
(iii)  $R_{hijk} = -R_{jkhi}$   
(iv)  $R_{hijk} + R_{hjki} + R_{khij} = 0$   
(b) State and prove quotient law of tensor. 10
- Compulsory**
3. (a) Explain the Fundamental concept of Relativity. 05

*Shankar*

  
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Science College, Congress Nagar,  
NAGPUR,

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-III)  
Session(2022-2023)**

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**Subject: General Relativity  
Assignment**

- Que. 1. Prove that Christoffel's symbols are not Tensor.
- Que. 2. Explain the Fundamental concept of relativity.
- Que. 3. Derive Schwarzschild exterior solution for Einstein empty space time field equation.
- Que. 4. Discuss the phenomenon of Red Shift in General Relativity.
- Que.5. Find the expression for Energy momentum Tensor for perfect fluid.

  
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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



Section / Batch: Sem III  
 Subject : 10, 12  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month Nov/Dec  
 Teacher's Name Dr. V. T. Chaudhari

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods												20	Total										
			1	2	3	4	5	6	7	8	9	10	11	12			13	14	15	16	17	18	19			
1	Ku Amisha B. Waghade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
8	Ku Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
21	Ku. Tasieem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		

Chaudhari

Teacher

Head of Department

Head of Department

HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.



Section / \Batch: Sem III  
 Subject : **GA**  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month **December / January**  
 Teacher's Name **Dr. V.T. Chauhan**

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			19/10	20/12	21/12	22/12	23/12	24/12	25/12	26/12	27/12	28/12	29/12	30/12	31/12									
2	Ku Anuja M. Kaise			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chauhan*  
 Teacher

*Dr. V.T. Chauhan*  
 Head of Department

Principal

**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR.**

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics

M.Sc. II Semester -III(2022-23)

Paper -V(Operation Research I)

Internal Marks

Teacher Name: Dr. V.T. Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	3	1	2	15
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	5	2	2	2	11
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	5	5	3	2	15
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	2	3	2	3	10
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lihare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	7	3	2	3	15
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	9	4	4	5	22
21		Tasleem Sheikh	8	4	4	4	20
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Chauhan*



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RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : THIRD SEMESTER M.Sc. (MATHEMATICS) (CBCS)(NEW)

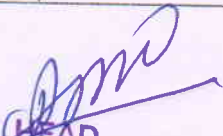
Subject Name : OPERATIONS RESEARCH I

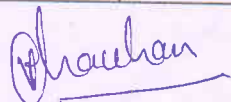
College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Winter-2022

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	735812	2021016600579393	AMISHA BHASKAR WAGHADE	15
2	735813	2021016600567144	ANUJA MORESHWAR KALSE	25
3	735814	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	735815	2021016600731804	ASHISH JANARDHAN GORE	11
5	735816	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	735817	2021016600693661	JYOTI BRIJLAL BISEN	25
7	735818	2021016600737097	KRUTIK SHESHRAO BHONGADE	15
8	735819	2021016600692561	KUNDA JAGANNATH PARATE	25
9	735820	2021016600598235	LILHARE RESHMA ISHWAR	25
10	735821	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	735822	2021016600579385	MINAL SANJAY MESHARAM	10
12	735823	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	735824	2021016600692576	POOJA GAJANAN BALAPURE	25
14	735825	2021016600573906	PRACHI PRALHAD KHOTELE	25
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20	735831	2021016600692545	TANAYA RAJU KALEWAR	22
21	735832	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
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23	735834	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 08-02-2023 01-43-32 PM

  
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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur**

**Department of Mathematics**

**M.Sc II Semester III**

**Paper- Operational Research - I**

**Unit Test-I**

**Date: 06<sup>th</sup> Sept. 2022**

**Duration : 1 Hour ]**

**[Max mark: 25 Marks**

**Attempt Any ONE question**

1. (a) Solve the LPP :

$$\text{Max } Z = 22x_1 + 30x_2 + 25x_3$$

subject to the constraints :

$$2x_1 + 2x_2 \leq 100$$

$$2x_1 + x_2 + x_3 \leq 100$$

$$x_1 + 2x_2 + 2x_3 \leq 100$$

$$x_1, x_2, x_3 \geq 0.$$

10

- (b) Use Dual Simplex method to :

$$\text{Min } Z = x_1 + x_2$$

subject to the constraints :

$$2x_1 + x_2 \geq 4$$

$$x_1 + 7x_2 \geq 7$$

$$x_1, x_2 \geq 0.$$

10

2. (a) Use Big M method to :

$$\text{Min } Z = 5x_1 - 6x_2 - 7x_3$$

subject to the constraints :

$$x_1 + 5x_2 - 3x_3 \geq 15$$

$$5x_1 - 6x_2 + 10x_3 \geq 10$$

$$x_1 + x_2 + x_3 = 5$$

$$x_1, x_2, x_3 \geq 0.$$

10

- (b) Use two phase Simplex method to :

$$\text{Max } Z = 2x_1 + x_2 + x_3$$

subject to the constraints :


$$4x_1 + 6x_2 + 3x_3 \leq 8$$

$$3x_1 - 6x_2 - 4x_3 \leq 1$$

$$2x_1 + 3x_2 - 5x_3 \geq 4$$

$$x_1, x_2, x_3 \geq 0.$$

10

  
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**NAGPUR.**



**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-III)  
Session(2022-2023)**

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**Subject: Operational Research-I  
Assignment**

Que. 1 Obtain all the basic feasible solutions to the following system of linear

$$\text{equations: } x_1 + 2x_2 + x_3 = 4 : 2x_1 + x_2 + 5x_3 = 5$$

Que. 2 Solve LPP by simplex method

$$\text{Max } Z = 2x_1 + 5x_2$$

$$\text{subject to } 0 \leq x_1 \leq 400$$

$$0 \leq x_2 \leq 300$$

$$x_1 + x_2 \leq 600$$

$$\text{and } x_1, x_2 \geq 0$$

Que. 3 Solve the following IPP :  $\text{Max } Z = 2x_1 + 3x_2$

subject to the constraints :

$$-3x_1 + 7x_2 \leq 14$$

$$7x_1 - 3x_2 \leq 14$$

$x_1, x_2 \geq 0$  and are integers.

Que.4 What is a non-linear programming problem? Give two examples of NLPP stating

clearly why do you so classify them.

Que.5 Solve the NLPP: Optimize  $Z = 4x_1^2 + 2x_2^2 + x_3^2 - 4x_1x_2$

$$\text{Subject to constraints: } x_1 + x_2 + x_3 = 15,$$

$$2x_1 - x_2 + 2x_3 = 20$$

HEAD

Department of Mathematics  
Science College, Congress Nagar  
Nagpur, M.P.

*Phauhan*

Section / Batch: Sem III  
 Subject: OR-I  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month November / December  
 Teacher's Name D.S. V.T. Chauhan

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chauhan*  
 Teacher

Teacher

*DM*  
 Head of Department  
**HEAD**

Head of Department

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / \Batch: Sem III  
 Subject : OR-I  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			19/11/20	2/12	2/12	24/12	27/12	28/12	29/12	31/12		02/01	09/01	10/01	11/01	12/01	13/01	14/01	18/01	19/01	20/01			
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
17	Ku Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
19	Ku Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
20	Ku Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
21	Ku Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P			

*Chauhan*

Teacher

*Am*

Head of Department

Principal

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 W. G. U. N.

Month December / January  
 Teacher's Name Dr. V. T. Chauhan

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -IV(2022-23)  
Paper -I(Dynamical System)

Internal Marks

Teacher Name: Chanchal Jain

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	7	3	2	3	18
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	4	4	5	25
4		Ashish J. Gore	5	2	2	2	18
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	10	2	1	2	18
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	1	2	11
11		Pooja G. Balapure	9	5	4	4	25
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lilhare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	6	4	2	3	18
18		Supriya S. Pohare	10	5	5	5	23
19		Suraj S. Bante	10	5	4	5	25
20		Tanaya R. Kalewar	10	5	2	3	25
21		Tasleem Sheikh	10	5	2	3	20
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*eJain*



*[Signature]*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.





**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**

**Internal Marks Sheet**


**Exam Name :** FOURTH SEMESTER M.Sc. (MATHEMATICS) (CBCS)  
**Subject Name :** DYNAMICAL SYSTEMS  
**College Name :** (100) SHRI SHIVAJI SCIENCE COLLEGE  
**Session :** Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	495432	2021016600579393	AMISHA BHASKAR WAGHADE	18
2	495433	2021016600567144	ANUJA MORESHWAR KALSE	25
3	495434	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	495435	2021016600731804	ASHISH JANARDHAN GORE	18
5	495436	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	495437	2021016600693661	JYOTI BRIJLAL BISEN	25
7	495438	2021016600737097	KRUTIK SHESHRAO BHONGADE	18
8	495439	2021016600692561	KUNDA JAGANNATH PARATE	25
9	495440	2021016600598235	LILHARE RESHMA ISHWAR	25
10	495441	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	495442	2021016600579385	MINAL SANJAY MESHRAM	11
12	495443	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	495444	2021016600692576	POOJA GAJANAN BALAPURE	25
14	495445	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	495446	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	495447	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	495448	2021016600737147	SUMEDH NARESH RAMTEKE	18
18	495449	2021016600696493	SUPRIYA SUDESH POHARE	23
19	495450	2021016600565996	SURAJ SHARAD BANTE	25
20	495451	2021016600692545	TANAYA RAJU KALEWAR	25
21	495452	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	20
22	495453	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	495454	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 27-06-2023 12-54-01 PM

  
**HEAD**

**Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.**

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's**  
**Science College, Congress Nagar, Nagpur**  
**Department of Mathematics**  
**M.Sc II Semester-IV**  
**Paper-I Dynamical System**  
**Unit Test-I**  
Date: 1<sup>st</sup> Feb. 2023

Duration : 1 Hour ]

[Max mark: 25 Marks

**Attempt Any ONE questions**

1. (a) Let  $U : [0, \alpha] \rightarrow \mathbb{R}$  be continuous & non-negative, Suppose  $c \geq 0$ ,  $k \geq 0$  are such that  $U(t) \leq C + \int_0^t kU(s)ds$ . For all  $t \in [0, \alpha]$  then Show that  $u(t) \leq ce^{kt}$ , for all  $t \in [0, \alpha]$ . (10)
- (b) Show that  $\Omega$  is an open set in  $\mathbb{R} \times W$ .  
Also Show that  $\Phi: \Omega \rightarrow W$  is a continuous map. (10)


OR

2. (a) Let  $W \subset E$  be open, let  $f: W \rightarrow E$  be  $C^1$  - map. Let  $y(t)$  be a solution on a maximal open interval  $J = (\alpha, \beta) \subset \mathbb{R}$  with  $\beta < \infty$  then given any compact set  $K \subset W$  there is some  $t \in (\alpha, \beta)$  with  $y(t) \in K$ . (10)
- (b) The map  $\Phi_t$  sends  $U$  onto open set  $V$  &  $\Phi_{-t}$  is defined on  $V$  & sends  $V$  onto  $U$ . The composition  $\Phi_{-t}\Phi_t$  is the identity map of  $U$ , the composition  $\Phi_t\Phi_{-t}$  is identity map of  $V$ . (10)

**Compulsory Questions**

3. (a) Define Locally Lipschitz Function.  
If  $f: W \rightarrow E$  is locally Lipschitz and  $A$  is proper subset of  $W$  is compact set then Show that  $f|_A$  is Lipschitz. (05)

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**HEAD**  
Department of Mathematics  
Science College, Congress Nagar, Nagpur

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-IV)  
Session(2022-2023)**

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**Subject: Dynamical System  
Assignment**

Que. 1. Prove that  $w$ -limit set of trajectory is closed invariant set.


Que. 2. Show that  $\Omega$  is an open set in  $R \times W$ . also show that  $\phi: \Omega \rightarrow W$  is a continuous map.

Que. 3. Show that an equilibrium system the eigen values are real.

Que. 4. Discuss the motion of a pendulum moving in a vertical plane as an example of a non linear sink.

Que.5. Let  $\bar{x}$  be a isolated minimum of  $V$ . then show that  $\bar{x}$  is asymptotically stable equilibrium Gradient system  $x' = -2x - y'$

ejein

  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem III  
 Subject: ~~Math~~  
 Theory / Practical: D.S.

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - III

Month Teacher's Name March  
 Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1	Ku Amisha B. Waghade		13	23	33	6/3	9/3	10/3	13/3	14/3	15/3	14/3	17/3	20/3	21/3	23/3	24/3	25/3	28/3	29/3	31/3		
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chanchal Jain*  
 Teacher

*Chanchal Jain*  
 Head of Department  
 HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / Batch: Sem III  
 Subject: ~~Math~~ II  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - IV

Month: ~~March~~ April  
 Teacher's Name: Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																				Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Ku Amisha B. Waghade		1/4	3/4	4/4	5/4	6/4	8/4	10/4	11/4	12/4	13/4	15/4	17/4	18/4	19/4	21/4	23/4	24/4	24/4	24/4	30/4	
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chanchal Jain*  
 Teacher

Principal

*Amud*  
 Head of Department

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / Batch: Sem I  
 Subject: ~~Math~~ D.S.  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
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Attendance Sheet 2022-23

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			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Ku Amisha B. Waghade		27/4	28/4	29/4	30/4	1/5	2/5	3/5	4/5	6/5												
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P												
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P												
4	Ashish J. Gore		A	P	P	P	P	P	P	P	P												
5	Dewanshish S. Turmdam		P	P	P	P	P	P	P	P	P												
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P												
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P												
8	Kunda J. Parate		P	P	P	P	P	P	P	P	P												
9	Mayuri G. Deshmukh		P	P	P	A	P	P	P	P	P												
10	Minal S. Meshram		P	P	A	P	P	P	P	P	P												
11	Pooja G. Balapure		P	P	P	P	P	P	P	P	P												
12	Prachi P. Khotale		P	P	P	P	P	P	P	P	P												
13	Rasika D. Bawankar		P	P	A	P	P	P	P	P	P												
14	Reshma I. Lihare		A	P	P	P	P	P	P	P	P												
15	shruti M. More		A	A	A	P	P	P	P	P	P												
16	Sruthi V. Bangalkar		A	A	P	P	P	P	P	P	P												
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P												
18	Supriya S. Pohare		P	P	P	P	P	P	P	P	P												
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P												
20	Ku. Tanaya R. Kalewar		A	P	P	P	P	P	P	P	P												
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P												
22	Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P												
23	Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P												
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P												

Month: April / May  
 Teacher's Name: Chanchal Jain

*Chanchal Jain*

Teacher

*Chanchal Jain*

Head of Department

Principal

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics

M.Sc. II Semester -IV(2022-23)

Paper -II(Partial Differential Equation)

Internal Marks

Teacher Name: Sandhya Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	3	2	3	18
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	10	5	5	5	25
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	9	4	1	4	18
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	2	2	11
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lilhare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Sruthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	8	4	2	3	18
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	10	5	4	5	24
21		Tasleem Sheikh	10	5	3	3	21
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Sandhya Chauhan*



*Sandhya Chauhan*  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
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RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : FOURTH SEMESTER M.Sc. (MATHEMATICS) (CBCS)

Subject Name : PARTIAL DIFFERENTIAL EQUATIONS

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	495432	2021016600579393	AMISHA BHASKAR WAGHADE	18
2	495433	2021016600567144	ANUJA MORESHWAR KALSE	25
3	495434	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	495435	2021016600731804	ASHISH JANARDHAN GORE	25
5	495436	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	495437	2021016600693661	JYOTI BRIJLAL BISEN	25
7	495438	2021016600737097	KRUTIK SHESHRAO BHONGADE	18
8	495439	2021016600692561	KUNDA JAGANNATH PARATE	25
9	495440	2021016600598235	LILHARE RESHMA ISHWAR	25
10	495441	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	495442	2021016600579385	MINAL SANJAY MESHARAM	11
12	495443	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	495444	2021016600692576	POOJA GAJANAN BALAPURE	25
14	495445	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	495446	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	495447	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	495448	2021016600737147	SUMEDH NARESH RAMTEKE	18
18	495449	2021016600696493	SUPRIYA SUDESH POHARE	25
19	495450	2021016600565996	SURAJ SHARAD BANTE	25
20	495451	2021016600692545	TANAYA RAJU KALEWAR	24
21	495452	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	21
22	495453	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	495454	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 27-06-2023 01-01-18 PM

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Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Signature of Examiner

*Chauhan*



**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc II Semester-IV  
Paper-II Partial Differential Equation  
Unit Test-I  
Date: 3<sup>rd</sup> Feb 2023**

**Duration : 1 Hour ]**

**[Max mark: 25 Marks**

**Attempt Any ONE questions**

1. (a) Show that the equation are compatible and find one parameter family of solutions  
 $px-yq=0$   
 $x^2p + q - xz = 0.$  (10)
- (b) Show that the pfaffians differential equation is is integrable and find its integral  
 $ydx+xdy+2zdz+0$  (10)

OR

2. (a) Find the general Integral of  $z_t + zz_x = 0$  and verify that it satisfies the equation. (10)
- (b) Give the classification of first order pde and also classify there integral. (10)

Compulsory

3. (a) Define Curve and surface . (05)

*Phauhan*

*[Signature]*  
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Science College, Congress Nagar,  
NAGPUR

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-IV)  
Session(2022-2023)**

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**Subject: Partial Differential Equation  
Assignment**


Que. 1. Define Curve and Surfaces . also classify second order PDE.

Que. 2. Give the classification of first order PDE also classify their integral.

Que. 3. Show that the Pfaffian differential equation is integrable and find its integral  $xdx + ydy + 2zdz = 0$ .

Que. 4. Find the Integral of the following equation by using Charpit's method  $x^2 + y^2 = x + y$ .

Que. 5. Solve by using Jacobi's method  $xp^2 + yq^2 = z$ .

  
HEAD  
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Science College, Congress Nagar,  
NAGPUR.

  
Shauhan

Section / Batch: Sem IV  
 Subject : **ORAI PDE**  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - IV

Month **March 2023**  
 Teacher's Name **Dr. V.T. Chauhan**

**SANDHYA  
 CHAUHAN**

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
			Date	6	8	9	10	11	13	14	15	16	17	18	20	21	23	24	25	27	29	31			
1	Ku Amisha B. Waghade			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	Ku Anuja M. Kalse							P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Dewanshish S. Tumdam						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade																								
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram																								
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotele			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lilhare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Ku Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Ku Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar																								
21	Ku. Tasleem Sheikh																								
22	Ku Vaishnavi Vaidya						P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande																								
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

**S. Chauhan**  
 Teacher

**Amu**  
 Head of Department

**HEAD**  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Principal



Section Batch: Sem IV ( 2022-2023 )

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Month  
Teacher's Name

MAY - 2023  
SANDHYA CHAUHAN

Subject: PDE  
Theory / Practical:

M.Sc. II (Mathematics) Sem - IV

Attendance Sheet ( 2022-2023 )

S.N	Name	Total Upto		Periods		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total			
		Deli	Att	Date	Contact No.																					Deli	Att		
																												Month	Progras sive
1	Ku Amisha B. Waghade					02/04/23																							
2	Ku Anuja M. Kalse					05/05/23	P	P																					
3	Ku Asawari A. Deshmukh						P	P																					
	Ashish J. Gore																												
5	Dewanshish S. Tumdam						P	P																					
6	Ku Jyoti B. Bisen						P	P																					
7	Krutik S. Bhongade																												
8	Ku Kunda J. Parate						P	P																					
9	Ku Mayuri G. Deshmukh						P	P																					
10	Ku Minal S. Meshram						P	P																					
11	Ku Pooja G. Balapure						P	P																					
12	Ku Prachi P. Khothele						P	P																					
13	Ku Rasika Bawankar						P	P																					
14	Ku Reshma I. Lihare						P	P																					
15	Ku Shrushti V. Bangalkar						P	P																					
16	Ku Shruti M. More						P	P																					
17	Ku Sukheshni P. Kakde																												
18	Ku Sumedh R. Ramteke																												
19	Ku Supriya S. Pohare																												
20	Ku Suraj S. Bante																												
21	Ku Tasleema Yusuf Sheikh						P	P																					
22	Ku Tanaya R. Kalewar						P	P																					
23	Ku Vaishnavi M. Vaidya						P	P																					
24	Ku Vrushali D. Lokhande																												
25	Ku Yamini R. Borkar						P	P																					

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Department of Mathematics  
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SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -IV(2022-23)  
Paper -III(Advanced Numerical Method)

Internal Marks

Teacher Name: ~~Sandhya Chauhan~~ Chanchal Jain

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	3	2	3	18
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	10	4	2	2	18
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	9	5	1	4	19
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	2	2	11
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lihare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	9	4	2	3	18
18		Supriya S. Pohare	10	5	4	5	24
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	10	5	5	5	25
21		Tasleem Sheikh	10	5	3	4	22
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Shauhan*



*Chanchal Jain*  
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RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : FOURTH SEMESTER M.Sc. (MATHEMATICS) (CBCS)  
Subject Name : ADVANCED NUMERICAL METHODS  
College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE  
Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	495432	2021016600579393	AMISHA BHASKAR WAGHADE	18
2	495433	2021016600567144	ANUJA MORESHWAR KALSE	25
3	495434	2021016600696477	ASAWARI ANILRAO DESHMUKHI	25
4	495435	2021016600731804	ASHISH JANARDHAN GORE	18
5	495436	2021016600573914	DEWASHISH SHIRHAM TUMDAM	25
6	495437	2021016600693661	JYOTI BRIJLAL BISEN	25
7	495438	2021016600737097	KRUTIK SureshRAO BHONGADE	19
8	495439	2021016600692561	KUNDA JAGANNATH PARATI	25
9	495440	2021016600598235	LILJARE RESHIMA ISHWAR	25
10	495441	2021016600563823	MAYURI GANGADHAR DESHMUKHI	25
11	495442	2021016600579385	MINAL SANJAY MESHIRAM	11
12	495443	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	495444	2021016600692576	POOJA GAJANAN BALAPURE	25
14	495445	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	495446	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	495447	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	495448	2021016600737147	SUMEDH NARESH RAMTEKE	18
18	495449	2021016600696493	SUPRIYA SUDESH POKARE	24
19	495450	2021016600565996	SURAJ SHARAD DANTE	25
20	495451	2021016600692545	TANAYA RAJU KALEWAR	25
21	495452	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	22
22	495453	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	495454	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 27-06-2023 01:06:13 PM

Signature of Examiner

27/06/23  
(Dr. V. T. Chaudhari)

HEAD

Department of Mathematics  
Science College, Congress Nagar,  
C.P.U.

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur

Department of Mathematics  
M.Sc-II Semester-IV  
Advance Numerical Method  
Unit Test - I

Date: 4<sup>th</sup> Feb 2023

Duration: 1 Hour ]

[Max mark: 25 Marks

Attempt Any ONE questions

1. (a) Obtain the real roots of the following iteration by Secant Method  
 $x^6 - x - 1 = 0$

(10)

- (b) Show that the equation  $f(x) = 0$  with  
 $f(x) = x^4 - 5.4x^3 + 10.56x^2 - 8.954x + 2.7951$  has a triple root near 1 and hence find the  
triple root by Newton's method.

(10)

OR

2. (a) Find the real root of equation  $x^3 = 1 - x^2$  on  $[0,1]$  with an accuracy of  $10^{-4}$ ,  
Using one point iteration method.

(10)

- (b) Discuss Secant Method for Root finding and its Error Formula.

(10)

Compulsory Questions

3. (a) Derive Newton's Formula to find repeated root of an equation  $f(x)=0$ .

(05)

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**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-IV)  
Session(2022-2023)**

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**Subject: Numerical Method  
Assignment**

Que. 1. Obtain the real roots of following iteration by secant method

$$x^6 - x - 1 = 0$$


Que. 2. Discuss Secant method for root finding and it's error formula.

Que. 3. State and prove Hermite-Gennochi Theorem.

Que.4. Derive Hermite interpolation and Hermite divide difference Formula.

Que.5. Derive Newton's formula to find repeated root of an equation  $f(x)=0$

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HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem IV  
 Subject :  
 Theory / Practical : A.N.M.

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem -IV

Month  
 Teacher's Name

March  
 Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade			1/3	2/3	3/3	6/3	9/3	10/3	13/3	14/3	15/3	16/3	17/3	18/3	20/3	21/3	22/3	23/3	24/3	25/3	28/3	29/3	30/3	
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Turmdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Ku Sumedh K. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Ku Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

Jain

Teacher

Head of Department  
 HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Section / Batch: Sem IV  
 Subject: A.N.M.  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem -IV

Month  
 Teacher's Name

March

April

Chanchal Jain

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
1	Ku Amisha B. Waghade			1/4	3/4	4/4	5/4	6/4	6/4	10/4	11/4	14/4	13/4	15/4	17/4	18/4	19/4	20/4	21/4	22/4	23/4	24/4	24/4	
2	Ku Anuja M. Kalse			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S. Tumdam			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

*Chanchal Jain*

Teacher

Head of Department

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

Principal

Section / Batch: SemIV  
 Subject: *P.N.M*  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - IV

Month *April / May*  
 Teacher's Name *Chanchal Jain*

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																				Total	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	Ku Amisha B. Waghade		<i>27/28/29/30/31/1/4</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
2	Ku Anuja M. Kalse		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
3	Ku Asawari A. Deshmukh		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
4	Ashish J. Gore		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
5	Dewanshish S. Tumdam		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
6	Ku Jyoti B. Bisen		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
7	Krutik S. Bhongade		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
8	Kunda J. Parate		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
9	Ku Mayuri G. Deshmukh		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
10	Ku Minal S. Meshram		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
11	Ku Pooja G. Balapure		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
12	Ku Prachi P. Khotale		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
13	Ku Rasika D. Bawankar		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
14	Ku Reshma I. Lilhare		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
15	Ku shruti M. More		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
16	Ku Sruthi V. Bangalkar		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
17	Sumedh R. Ramteke		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
18	Ku Supriya S. Pohare		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
19	Ku Suraj S. Bante		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
20	Ku Tanaya R. Kalewar		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
21	Ku Tasleem Sheikh		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
22	Ku Vaishnavi Vaidya		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
23	Ku Vrushali D. Lokhande		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	
24	Ku Yamini R. Borkar		<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>	

*eJem*  
 Teacher

*Am*  
 Head of Department, P.N.C.P.S.

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -IV(2022-23)  
Paper -IV(Cosmology)  
Internal Marks

Teacher Name: Dr. V. T.Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	3	2	3	18
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	10	4	2	2	18
5		Dewanshish S.Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	9	5	1	4	19
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	2	2	11
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotete	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lihare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	9	4	2	3	19
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	10	5	4	5	24
21		Tasleem Sheikh	10	5	3	4	22
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Chauhan*



*Am*  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR

Internal Marks Sheet

Exam Name : FOURTH SEMESTER M.Sc. (MATHEMATICS) (CBCS)

Subject Name : ELECTIVE : COSMOLOGY

College Name : (100) SHRI SHIVAJI SCIENCE COLLEGE

Session : Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	495432	2021016600579393	AMISHA BHASKAR WAGHADE	18
2	495433	2021016600567144	ANUJA MORESHWAR KALSE	25
3	495434	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	495435	2021016600731804	ASHISH JANARDHAN GORE	18
5	495436	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	495437	2021016600693661	JYOTI BRIJLAL BIEN	25
7	495438	2021016600737097	KRUTIK SHESHRAO BHONGADE	19
8	495439	2021016600692561	KUNDA JAGANNATH PARATE	25
9	495440	2021016600598235	LILHARE RESHMA ISHWAR	25
10	495441	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	495442	2021016600579385	MINAL SANJAY MESHRAM	11
12	495443	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	495444	2021016600692576	POOJA GAJANAN BALAPURE	25
14	495445	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	495446	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	495447	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	495448	2021016600737147	SUMEDH NARESH RAMTEKE	19
18	495449	2021016600696493	SUPRIYA SUDESH POHARE	25
19	495450	2021016600565996	SURAJ SHARAD BANTE	25
20	495451	2021016600692545	TANAYA RAJU KALEWAR	24
21	495452	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	22
22	495453	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	495454	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 27-06-2023 01-09-30 PM

  
HEAD

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur**

**Department of Mathematics**

**M.Sc-II Semester-IV**

**Paper IV Cosmology**

**Unit Test - I**

**Date: 6<sup>th</sup> Feb 2023**

**Duration: 1 Hour ]**

**[ Max mark: 25 Marks**


**Attempt Any ONE questions**

- |    |  |    |
|----|--|----|
| 1. | (a) Derive Static cosmological model of de-sitter universe.                                  | 10 |
|    | (b) Discuss the motion of test particle in Einstein static universe.                         | 10 |
| 2. | (a) Discuss the geometry including spherical and elliptical space for the Einstein universe. | 10 |
|    | (b) Discuss the motion of test particle in de-sitter universe.                               | 10 |

**Compulsory**

- |   |  |    |
|---|--|----|
| 3 | (a) Give the comparison between Einstein and D sitter Model. | 05 |
|---|--|----|

*Pharhan*

  
**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR.**

**S.S.E.S.A's Science College,  
Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc. -II(sem-IV)  
Session(2022-2023)**

---

**Subject: Cosmology  
Assignment**

- Que. 1. Derive statistic cosmological model of Desitter universe.
- Que. 2. Explain Weyl's postulate.
- Que.3. Discuss the motion of dust partical in Desitter universe
- Que. 4. Explain the matter dominated era of the universe.
- Que. 5. Prove that Hubble's law gives a linear relation between Red shift and dishatnce of receding Galaxy.

*Phauhan*

*[Signature]*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.



Section / Batch: Sem IV

Subject: Cosmology

Theory / Practical: Cosmology

Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
M.Sc. II (Mathematics) Sem - IV

Month: March  
Teacher's Name: V.T. Chauhan

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods												Total												
			1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20				
1	Ku Amisha B. Waghade		1/3	2/3	3/3	6/3	9/3	10/3	13/3	14/3	15/3	16/3	17/3	18/3	19/3	20/3	21/3	22/3	23/3	24/3	25/3	26/3	27/3	28/3	29/3	30/3	31/3
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Ku Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

*Chauhan*

Teacher:

*[Signature]*  
Head of Department

Principal

Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.

Section / Batch: Sem III  
 Subject: Cosmology  
 Theory / Practical:

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem -IV

Month  
 Teacher's Name

March

April

V.T. Chauhan

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																				Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Ku Amisha B. Waghade		1/4	3/4	4/4	5/4	6/4	8/4	10/4	11/4	14/4	15/4	17/4	18/4	19/4	20/4	21/4	22/4	23/4	24/4	25/4	26/4	39/4
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	Dewanshish S. Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	Ku Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	Ku Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

*V.T. Chauhan*

Teacher

*V.T. Chauhan*

Head of Department

HEAD

Department of Mathematics  
 Science College, Congress Nagar,  
 N.A.G.PUR.

Principal


Section / \Batch: SemIV  
 Subject : Cosmology  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - IV

Month April/May  
 Teacher's Name Dr. V. T. Chauhan

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods																				Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	Ku Amisha B. Waghade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2	Ku Anuja M. Kalse		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
3	Ku Asawari A. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
4	Ashish J. Gore		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
5	Dewanshish S.Tumdam		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
6	Ku Jyoti B. Bisen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
7	Krutik S. Bhongade		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
8	Ku Kunda J. Parate		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
9	Ku Mayuri G. Deshmukh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
10	Ku Minal S. Meshram		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
11	Ku Pooja G. Balapure		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
12	Ku Prachi P. Khotale		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
13	Ku Rasika D. Bawankar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
14	Ku Reshma I. Lihare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
15	Ku shruti M. More		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
16	Ku Sruthi V. Bangalkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17	Sumedh R. Ramteke		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
18	Ku Supriya S. Pohare		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
19	Suraj S. Bante		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
20	Ku. Tanaya R. Kalewar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
21	Ku. Tasleem Sheikh		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
22	Ku Vaishnavi Vaidya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
23	Ku Vrushali D. Lokhande		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
24	Ku Yamini R. Borkar		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

  
 Teacher

Teacher

  
 HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.

SHRI SHIVAJI EDUCATION SOCIETY AMARAVATI'S  
SCIENCE COLLEGE, CONGRESS NAGAR, NAGPUR.

Department of Mathematics  
M.Sc. II Semester -IV(2022-23)  
Paper -V(Operational Research II)

Internal Marks

Teacher Name: Dr. V. T. Chauhan

Sr. no.	Roll No.	Name of Student	Unit Test (10)	Assignment (05)	Attendance (05)	Seminar (05)	Total (25)
1		Amisha B. Waghade	10	3	2	3	18
2		Anuja M. Kalse	10	5	5	5	25
3		Asawari A. Deshmukh	10	5	5	5	25
4		Ashish J. Gore	10	4	2	2	18
5		Dewanshish S. Tumdam	10	5	5	5	25
6		Jyoti B. Bisen	10	5	5	5	25
7		Krutik S. Bhongade	9	5	3	4	21
8		Kunda J. Parate	10	5	5	5	25
9		Mayuri G. Deshmukh	10	5	5	5	25
10		Minal S. Meshram	5	2	2	2	11
11		Pooja G. Balapure	10	5	5	5	25
12		Prachi P. Khotale	10	5	5	5	25
13		Rasika D. Bawankar	10	5	5	5	25
14		Reshma I. Lihare	10	5	5	5	25
15		shruti M. More	10	5	5	5	25
16		Srusthi V. Bangalkar	10	5	5	5	25
17		Sumedh R. Ramteke	9	4	2	3	18
18		Supriya S. Pohare	10	5	5	5	25
19		Suraj S. Bante	10	5	5	5	25
20		Tanaya R. Kalewar	10	4	4	4	22
21		Tasleem Sheikh	10	5	3	4	22
22		Vaishnavi Vaidya	10	5	5	5	25
23		Yamini R. Borkar	10	5	5	5	25

*Chauhan*



*Dr. V. T. Chauhan*  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,  
NAGPUR.




**RASHTRASAT TUKADOJI MAHARAJ NAGPUR UNIVERSITY,  
NAGPUR**


**Internal Marks Sheet**

**Exam Name :** FOURTH SEMESTER M.Sc. (MATHEMATICS) (CBCS)  
**Subject Name :** CORE SUBJECT CENTRIC : OPERATIONS RESEARCH -II  
**College Name :** (100) SHRI SHIVAJI SCIENCE COLLEGE  
**Session :** Summer-2023

Sr. No.	SEAT NO	ENROLLMENT NO	STUDENT NAME	Marks / Max 25
1	495432	2021016600579393	AMISHA BHASKAR WAGHADE	18
2	495433	2021016600567144	ANUJA MORESHWAR KALSE	25
3	495434	2021016600696477	ASAWARI ANILRAO DESHMUKH	25
4	495435	2021016600731804	ASHISH JANARDHAN GORE	18
5	495436	2021016600573914	DEWASHISH SHRIRAM TUMDAM	25
6	495437	2021016600693661	JYOTI BRIJLAL BISEN	25
7	495438	2021016600737097	KRUTIK SHESHRAO BHONGADE	21
8	495439	2021016600692561	KUNDA JAGANNATH PARATE	25
9	495440	2021016600598235	LILHARE RESHMA ISHWAR	25
10	495441	2021016600563823	MAYURI GANGADHAR DESHMUKH	25
11	495442	2021016600579385	MINAL SANJAY MESHAM	11
12	495443	2021016600692553	MORE SHRUTI MAHADEORAO	25
13	495444	2021016600692576	POOJA GAJANAN BALAPURE	25
14	495445	2021016600573906	PRACHI PRALHAD KHOTELE	25
15	495446	2021016600567167	RASIKA DHANPAL BAWANKAR	25
16	495447	2021016600591073	SRUSHTI VIJAY BANGALKAR	25
17	495448	2021016600737147	SUMEDH NARESH RAMTEKE	18
18	495449	2021016600696493	SUPRIYA SUDESH POHARE	25
19	495450	2021016600565996	SURAJ SHARAD BANTE	25
20	495451	2021016600692545	TANAYA RAJU KALEWAR	22
21	495452	2021016600731812	TASLEEMA PARVEEN YUSUF SHEIKH	22
22	495453	2021016600591107	VAISHNAVI MANOHARRAO VAIDYA	25
23	495454	2021016600696504	YAMINI RAJU BORKAR	25

Print Date & Time: 27-06-2023 01-14-02 PM

  
**HEAD**  
**Department of Mathematics**  
**Science College, Congress Nagar,**  
**NAGPUR,**

  
Signature of Examiner

**Shri Shivaji Education Society Amravati's  
Science College, Congress Nagar, Nagpur  
Department of Mathematics  
M.Sc-II Semester-IV  
Paper IV Operational Research II  
Unit Test-II**

Date: 7<sup>th</sup> Feb. 2023

Duration: 1 Hour]

[Max mark: 25 Marks

Attempt Any ONE questions

1. (a) Solve the following IPP :  
Min  $Z = 9x_1 + 10x_2$   
subject to the constraints :  
 $x_1 \leq 9, x_2 \leq 8$   
 $4x_1 + 3x_2 \geq 40$   
 $x_1, x_2 \geq 0$  and are integers. 10
- (b) Solve the following IPP :  
Max  $Z = 3x_1 + x_2 + 3x_3$   
subject to the constraints :  
 $-x_1 + 2x_2 + x_3 \leq 4$   
 $4x_2 - 3x_3 \leq 2$   
 $x_1 - 3x_2 + 2x_3 \leq 3$   
 $x_1, x_2, x_3 \geq 0$  and are integers. 10
2. (a) Solve the following IPP :  
Max  $Z = 200x_1 + 400x_2 + 300x_3$   
subject to the constraints :  
 $3x_1 + 4x_2 + 2x_3 \leq 60$   
 $2x_1 + x_2 + 2x_3 \leq 40$   
 $x_1 + 3x_2 + 2x_3 \leq 80$   
 $x_1, x_2, x_3 \geq 0$  and are integers. 10
- (b) Solve the following IPP :  
Max  $Z = 2x_1 + 3x_2$   
subject to the constraints :  
 $-3x_1 + 7x_2 \leq 14$   
 $7x_1 - 3x_2 \leq 14$   
 $x_1, x_2 \geq 0$  and are integers. 10
- 3 (a) What is the need for integer Programming 05

*Phalgun*

  
HEAD  
Department of Mathematics  
Science College, Congress Nagar,

**S.S.E.S.A's Science College , Congress Nagar, Nagpur**  
**Department of Mathematics**  
**M.Sc. -II(sem-IV) Session(2022-2023)**

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**Subject: Operational Research-II**  
**Assignment**

Que1.. Using the bounded variable technique, solve the following L.P.P.

$$\text{Max } Z = 2x_1 + x_2$$

subject to the constraints:

$$x_1 + 2x_2 \leq 10$$

$$x_1 + x_2 \leq 6$$

$$x_1 - x_2 \leq 2$$

$$x_1 - 2x_2 \leq 1$$

$$0 \leq x_1 \leq 3 \text{ and } 0 \leq x_2 \leq 2$$

Que.2 Use Revised Simplex Method to solve the LPP:  $\text{Max } Z = 2x_1 + x_2$

Subject to constraints:

$$\begin{aligned} 3x_1 + 4x_2 &\leq 6, \\ 6x_1 + x_2 &\leq 3, \\ x_1, x_2 &\geq 0 \end{aligned}$$

Que.3 Use Bounded Variable technique to solve the following LPP:

$$\text{Max } Z = x_2 + 3x_3$$

Subject to constraints:  $x_1 + x_2 + x_3 \leq 10, x_1 - 2x_3 \geq 0$

$$2x_2 - x_3 \leq 10$$

$$0 \leq x_1 \leq 8, 0 \leq x_2 \leq 4, 0 \leq x_3$$

Que.4 A company plans to consume 760 pieces of particular components. Past records indicate that purchasing department had used Rs.12,000 for placing 15,000 orders. The average inventory was valued at Rs. 45,000 and the total storage cost was Rs. 7,650 which included wages, rent, taxes, insurance etc. related to store department. The company borrows capital at the rate of 10% a year. If the price of a component is Rs. 12 and the order size is of 10 components, determine: purchase cost, purchase expenses, storage expenses, capital cost and total cost per year.

Que. 5 Discuss the EOQ problem with one price break

  
**HEAD**  
**Department of Mathematics**  
**Science College Congress Nagar.**  
Nagpur.



Section / Batch: Sem IV  
 Subject : OR-II  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc. II (Mathematics) Sem - IV

Attendance Sheet 2022-23

S.N.	Name	Total Upto last Month	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
1	Ku Amisha B. Waghade																								
2	Ku Anuja M. Kalse																								
3	Ku Asawari A. Deshmukh																								
4	Ashish J. Gore																								
5	Dewanshish S. Tumdam																								
6	Ku Jyoti B. Bisen																								
7	Krutik S. Bhongade																								
8	Ku Kunda J. Parate																								
9	Ku Mayuri G. Deshmukh																								
10	Ku Minal S. Meshram																								
11	Ku Pooja G. Balapure																								
12	Ku Prachi P. Khotale																								
13	Ku Rasika D. Bawankar																								
14	Ku Reshma I. Lilhare																								
15	Ku shruti M. More																								
16	Ku Sruthi V. Bangalkar																								
17	Sumedh R. Ramteke																								
18	Ku Supriya S. Pohare																								
19	Ku Suraj S. Bante																								
20	Ku Tanaya R. Kalewar																								
21	Ku Tasleem Sheikh																								
22	Ku Vaishnavi Vaidya																								
23	Ku Vrushali D. Lakhande																								
24	Ku Yamini R. Borkar																								

Visit to  
 Ramnagar  
 Government  
 school comp.  
 2023

U. T. Chauhan  
 Teacher

Head of Department

Principal

HEAD  
 Department of Mathematics  
 Science College, Congress Nagar  
 NAGPUR.



Section / Batch: Sem II  
 Subject: OR-II  
 Theory / Practical :

Shri Shivaji Education Society Amravati's  
 Science College, Congress Nagar, Nagpur  
 M.Sc.II (Mathematics) Sem - IV

Month  
 Teacher's Name

April

Attendance Sheet

S.N.	Name	Upto last M	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total		
1	Ku Amisha B. Waghade																									
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Teacher

*(Signature)*

Head of Department

*(Signature)*

HEAD

Principal

Department of Mathematics  
 Science College, Congress Nagar,  
 NAGPUR.