Sri A.S.N.M GOVERNMENT COLLEGE (A), PALAKOL,W.G.DT.

DEPARTMENT OF MATHEMATICS

CERTIFICATE COURSE IN MATHEMATICS

(2021-2022)

"DISCRETE MATHEMATICS"

COURSE COORDINATOR

Sri.K.SIVA KRISHNA, Lecturer in Mathematics

CONTENTS

Minutes of the meeting

The Department of Mathematics staff held meeting on 01-07-2021 and passed resolution to organize certificate course that is on Discrete Mathematics under the guidelines of Sri G.Srinivasa Rao , In-Charge of Mathematics for 30 working days.

The certificate course in **Discrete Mathematics** was organized from 01-07-2022 to 05-08-2021 for the academic year 2021-2022 to the II B.Sc.M.P.C, MPCs & MCCs students under curriculum enrichment programme.

Signature of the staff Members :

Sri G.SRINIVASA RAO, In-Charge of Mathematics

B.K.V. RAMA LAKSHMI, Contract lecturer in Mathematics

K.SIVA KRISHNA, Contract Lecturer in Mathematics

D.R.R.SUDHAKAR, Guest Lecturer in Mathematics

Signature of the Principal

Report on Certificate course Discrete Mathematics

Introduction:

Department of Mathematics conducted a Certificate Course in Discrete Mathematics during the academic year 2020-2021 under curriculum enrichment Programme.

Discrete Mathematics is the part of Mathematics devoted to the study of discrete objects. Here discrete means consisting of distinct or unconnected elements. The kinds of problems solved using discrete mathematics include:

- How many ways are there to choose a valid password on a computer?
- What is the probability of winning a lottery?
- Is there link between two computers in a network?

Etc.,

There are several important reasons for studying discrete mathematics. This course can develop mathematical maturity, that is ability to understand and create mathematical arguments. Students will not get very far in their studies in the Mathematical sciences without these skills

Discrete mathematics is the gateway to more advanced courses in all parts of the mathematical sciences. Discrete mathematics provides the mathematical foundations for many computer science courses including *data structures, algorithms, database theory , computer security and operating systems*

Math courses based on the material studied in discrete mathematics include *logic, set theory, number theory, linear algebra, abstract algebra, combinatorics, graph theory and probability theory*.

Course Objectives:

A discrete mathematics course has more than one purpose. Students should learn a particular set of mathematical facts and how to apply them. More importantly this course should teach students how to think logically and mathematically.

- To introduce the concepts of Mathematical logic.
- To introduce the concepts of Sets, Functions and Relations.
- To perform the operations associated with the Sets, Functions and Relations.
- Further develop the mathematical concepts and technique which should serve as a preparation for more advanced quantitative courses.

Learning Outcomes of Set Theory & Relations

Be able to draw and interpret Venn Diagrams of Set Relations and operations and use Venn Diagrams to solve problems. Recognize when set theory is applicable to real life situations, Solve real life problems and communicate real life problems and solutions to others.

- Identify the differences between a Relation and a Function.
- Calculate missing values for a stated function (or) function pattern.
- Recognize multiple representations of a linear functions.

SRI A.S.N.M. GOVT COLLEGE(A), PALAKOL

2021-2022 CERTIFICATE COURSE TIME TABLE

DEPARTMENT OF MATHEMATICS

S.NO.	DATE	CLASS	TIMINGS
1	01-07-2022	II B.Sc	9:00AM-10:00AM
2	02-07-2022	II B.Sc	9:00AM-10:00AM
3	04-07-2022	II B.Sc	9:00AM-10:00AM
4	05-07-2022	II B.Sc	9:00AM-10:00AM
5	06-07-2022	II B.Sc	9:00AM-10:00AM
6	07-07-2022	II B.Sc	9:00AM-10:00AM
7	08-07-2022	II B.Sc	9:00AM-10:00AM
8	11-07-2022	II B.Sc	9:00AM-10:00AM
9	12-07-2022	II B.Sc	9:00AM-10:00AM
10	13-07-2022	II B.Sc	9:00AM-10:00AM
11	14-07-2022	II B.Sc	9:00AM-10:00AM
12	15-07-2022	II B.Sc	9:00AM-10:00AM
13	16-07-2022	II B.Sc	9:00AM-10:00AM
14	18-07-2022	II B.Sc	9:00AM-10:00AM
15	19-07-2022	II B.Sc	9:00AM-10:00AM
16	20-07-2022	II B.Sc	9:00AM-10:00AM
17	21-07-2022	II B.Sc	9:00AM-10:00AM
18	22-07-2022	II B.Sc	9:00AM-10:00AM
19	23-07-2022	II B.Sc	9:00AM-10:00AM
20	25-07-2022	II B.Sc	9:00AM-10:00AM
21	26-07-2022	II B.Sc	9:00AM-10:00AM
22	27-07-2022	II B.Sc	9:00AM-10:00AM
23	28-07-2022	II B.Sc	9:00AM-10:00AM
24	29-07-2022	II B.Sc	9:00AM-10:00AM
25	30-07-2022	II B.Sc	9:00AM-10:00AM
26	01-08-2022	II B.Sc	9:00AM-10:00AM
27	02-08-2022	II B.Sc	9:00AM-10:00AM
28	03-08-2022	II B.Sc	9:00AM-10:00AM
29	04-08-2022	II B.Sc	9:00AM-10:00AM
30	05-08-2022	II B.Sc	9:00AM-10:00AM

PRINCIPAL
Sri A.S.N.M. GOVT. COLLEGE (A)
PALAKOL-534 260. W.G.DIST

List of students enrolled in Certificate course on Discrete Mathematics: II B.Sc.(MPCs)& II B.Sc.(MCCs) (01-07-2022 to 05-08-2022) 30 days from 9am to 10 am

S.No	Regd No.	Name of the student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			01/07	02/07	04/07	05/07	06/07	07/07	08/07	11/07	12/07	13/07	14/07	15/07	16/07	18/07	19/07
1	2021006	Ch.Lakshmi Priyanka	p	p	p	p	p	A	A	P	A	P	P	P	A	P	P
2	2021012	Seelam Hema	P	A	P	A	A	P	P	A	P	P	A	A	P	P	P
3	2021018	Y Baby Sowmya	p	p	p	p	p	p	p	p	A	p	p	p	p	p	p
4	2022019	A Amrutha Durga	p	p	p	A	p	p	p	A	p	p	p	p	A	p	p
5	2022021	A Kanaka Durga	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
6	2022022	A Neelima	p	p	A	p	p	p	A	p	p	p	p	A	p	A	p
7	2022024	B Dhana Raju	p	A	p	A	p	p	A	p	p	p	A	p	p	p	p
8	2022025	Ch P V Rakesh	p	A	p	p	A	p	p	A	p	p	p	p	A	p	p
9	2022026	Ch Stanley Peter	p	p	p	A	A	p	p	p	p	A	p	p	A	p	p
10	2022027	G Puspha Lalitha	p	A	p	p	A	A	p	p	p	A	p	p	p	A	p
11	2022029	K S Venkata Sandeep	p	p	p	p	p	p	A	p	p	p	p	A	p	p	p
12	2022030	L Suhasini	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
13	2022033	M Anitha	p	A	p	p	p	p	p	A	p	p	p	A	p	p	p
14	2022035	P Harshitha	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
15	2022036	Vanamadi Vasu	p	A	p	A	p	p	p	p	p	p	A	p	p	p	p
16	2022037	Villuri Hasini	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
17	2025074	Bandi Ramyasri	p	p	A	p	p	p	A	p	p	p	A	p	p	p	p
18	2025078	G Lalitha Devi	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
19	2025079	G Raghuvindra Varma	p	A	p	p	A	p	p	p	A	p	p	p	p	A	p
20	2025082	G Anusha	p	p	p	p	p	p	p	A	p	p	p	p	p	p	p
21	2025083	I Kalyani	p	p	A	p	p	p	p	p	p	p	p	A	p	p	p
22	2025085	J N Siva Prasad	p	A	p	p	p	p	p	A	p	p	p	p	A	p	p
23	2025088	K Tejeswari	p	p	p	p	p	p	A	p	p	p	p	p	p	p	p
24	2025090	K Raghavendra Rao	p	p	p	p	p	p	p	p	p	p	p	p	A	p	p
25	2025092	K Nageswari	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
26	2025094	P Hemanth Prakash	p	p	p	A	p	p	A	p	p	p	p	A	p	p	A
27	2025095	S Leela Bhavani	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
28	2025098	Undurthi Sailu	p	p	p	p	p	A	p	p	p	p	A	p	p	p	p
29	2025099	Varada Navya	p	p	p	p	p	p	p	p	A	p	p	p	p	p	p
30	2025101	Y Varshi Satya Sri	p	p	p	p	A	p	p	p	p	p	p	p	A	p	p

S.No	Regd No.	Name of the student	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
			20/07	21/07/	22/07	23/07	25/07	26/07	27/07	28/07	29/07	30/07	01/08	02/08	03/08	04/08	05/08
1	2021006	Ch.Lakshmi Priyanka	p	p	p	p	p	A	A	P	A	P	P	P	A	P	P
2	2021012	Seelam Hema	P	A	P	A	A	P	P	A	P	P	A	A	P	P	P
3	2021018	Y Baby Sowmya	p	p	p	p	p	p	p	p	A	p	p	p	p	p	p
4	2022019	A Amrutha Durga	p	p	p	A	p	p	p	A	p	p	p	p	A	p	p
5	2022021	A Kanaka Durga	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
6	2022022	A Neelima	p	p	A	p	p	p	A	p	p	p	p	A	p	A	p
7	2022024	B Dhana Raju	p	A	p	A	p	p	A	p	p	p	A	p	p	p	p
8	2022025	Ch P V Rakesh	p	A	p	p	A	p	p	A	p	p	p	p	A	p	p
9	2022026	Ch Stanley Peter	p	p	p	A	A	p	p	p	p	A	p	p	A	p	p
10	2022027	G Puspha Lalitha	p	A	p	p	A	A	p	p	p	A	p	p	p	A	p
11	2022029	K S Venkata Sandeep	p	p	p	p	p	p	A	p	p	p	p	A	p	p	p
12	2022030	L Suhasini	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
13	2022033	M Anitha	p	A	p	p	p	p	p	A	p	p	p	A	p	p	p
14	2022035	P Harshitha	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
15	2022036	Vanamadi Vasu	p	A	p	A	p	p	p	p	p	p	A	p	p	p	p
16	2022037	Villuri Hasini	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
17	2025074	Bandi Ramyasri	p	p	A	p	p	p	A	p	p	p	A	p	p	p	p
18	2025078	G Lalitha Devi	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
19	2025079	G Raghuvindra Varma	p	A	p	p	A	p	p	p	A	p	p	p	p	A	p
20	2025082	G Anusha	p	p	p	p	p	p	p	A	p	p	p	p	p	p	p
21	2025083	I Kalyani	p	p	A	p	p	p	p	p	p	p	p	A	p	p	p
22	2025085	J N Siva Prasad	p	A	p	p	p	p	p	A	p	p	p	p	A	p	p
23	2025088	K Tejeswari	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
24	2025090	K Raghavendra Rao	p	p	p	p	p	p	A	p	p	p	p	p	p	A	p
25	2025092	K Nageswari	p	p	p	A	p	p	p	p	p	p	p	p	A	p	p
26	2025094	P Hemanth Prakash	p	p	A	p	p	A	p	p	p	p	A	p	p	p	p
27	2025095	S Leela Bhavani	p	p	p	p	p	A	p	p	p	p	p	A	p	p	p
28	2025098	Undurthi Sailu	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
29	2025099	Varada Navya	p	p	p	A	p	p	p	p	p	p	p	p	p	p	p
30	2025101	Y Varshi Satya Sri	p	p	p	p	p	p	A	p	p	p	p	A	p	p	p

Course Syallabus

SYLLABUS :
Unit-1 SET THEORY 1. Set Operations 2. Functions
Unit-2 RELATIONS 1. Functions as Relations. 2. Properties of Relations. 3. Combining Relations.

TEXT BOOK:

DISCRETE
MATHEMATICS
&
ITS APPLICATIONS
WITH COMBINATORICS AND GRAPH THEORY

BY KENNETH H ROSEN

Question Paper

Name of the Student:_____ Class:_____ Date:_____

Answer all the questions. Each question carries 2 Marks 25 X 2 = 50

1. Who is the founder of Set theory? [a]
   a) George Cantor b) John Venn c) Rene Descartes d) Russel
2. Which of the following is an infinite Set ? [d]
   a) A= { x: x is odd and x<10 } c) C ={ x: xϵN , 7<x<9 }
   b) B= { x: xϵN , 70>x<50 } d) D={ x: xϵN , x>10}
3. Which of the following two sets are equal? [c]
   a) A = {1, 2} and B = {1} c) A = {1, 2, 3} and B = {2, 1, 3}
   b) A = {1, 2} and B = {1, 2, 3} d) A = {1, 2, 4} and B = {1, 2, 3}
4. Two sets are called disjoint if _____ is the empty set [c]
   a) Difference b) Union c) Intersection d) Complement
5. The set containing all the collection of subsets is known as _____ [b]
   a) Subset b) Power set c) Union set d) None of the mentioned
6. Power set of empty set has exactly _____ subset. [a]
   a) One b) Two c) Zero d) Three
7. What is the cardinality of the set of odd positive integers less than 10? [b]
   a) 10 b) 5 c) 3 d) 20
8. What is the Cardinality of the Power set of the set {0, 1, 2}? [a]
   a) 8 b) 6 c) 7 d) 9
9. If Set AXB = BXA then which of the following sets mat satisfy? [a]
   a) A={1,2}, B={2,1} c) A={1,2,3}, B={2,3,4}
   b) A={1,2,3}, B={1,2,3,4} d) None.
10. If set A has 4 elements and B has 3 elements then set n(A X B) is? [b]
    a) 14 b) 12 c) 24 d) 7
11. Which of the following statement is wrong? [b]
    a) A $\cap$ A = A b) (A U B)' = A' U B' c) A U A = A d) A – (B $\cap$ C) = (A – B) U (A –C)
12. A function is said to be _____ if and only if f(a) = f(b) implies that a = b for all a and b in the domain of f. [b]
    a) One-to-many b) One-to-one c) Many-to-many d) Many-to-one
13. The function f(x)=x+1 from the set of integers to itself is onto. [a]
    Is it True or False? a) True b) False

14. Let f and g be the function from the set of integers to itself, defined by f(x)=2x+1 and g(x) =3x+4. Then the composition of f and g (f*0*g)_____ [b]

a) 6x+8 b) 6x+9 c) 6x+6 d) 6x+7

15. If f is a function defined from R to R given by f(x)=3x-5 then f-1(x)=__ [a]

a) (x+5)/3 b) 1/(3x-5) c) (x-5)/3 d) None

16. A floor function map a real number to _____ [b]

a) smallest previous integer c) smallest following integer

b) greatest previous integer d) none of the mentioned

17. A Ceil function map a real number to _____ [a]

a) smallest previous integer c) smallest following integer

b) greatest previous integer d) none of the mentioned

18. What is the value of Floor(8.4) + Ceil(9.9)? [a]

a) 18 b) 19 c) 20 d) 17

19. A relation means …… on a set S. [b]

a) dual relation b) binary relation c) reflexive relation d) symmetric relation

20. A relation R on set A is called _____ if xRy implies yRx.

a) Irreflexive b) Reflexive c) Anti-Symmetric d) Symmetric

21. If R is reflexive, Symmetric and Transitive then the relation is said to be [c]

a) binary relation c) equivalence relation

b) compatabilty relation d) partial ordered relation .

22. A …. is a set S with a relation R on it which is reflexive, anti-symmetric, and transitive. [d]

a) equivalent set b) ordered set c) implicit set d) Partially ordered set

23. Which of the following relations is the reflexive relation over the set {1, 2, 3, 4}? [b]

a) {(0,0), (1,1), (2,2), (2,3)} c) {,(1,1), (1,2), (2,1), (2,3), (3,4)}

b) {(1,1), (1,2), (2,2), (3,3), (4,3), (4,4)} d) {(0,1), (1,1), (2,3), (2,2), (3,4), (3,1)

24. If R = {(2,1), (3,1), (5,1), (5,4)} then R^{-1} = [c]

a) {(2,1), (3,1), (5,1), (4,5)} c) {(1,2), (1,3), (1,5), (4,5)}

b) {(2,1), (3,1), (5,1), (5,4)} d) {(2,1), (3,1), (5,1), (4,5)}

25. How many transitive relations are there on a set with n elements if [c]

a) n=1 b) n=2 c) n=3 d) None

Marks obtained in Discrete Mathematics Exam Date: 18-08-2022

S.No	Regd. No	Name of the Student	Marks Obtained
1	2021006	Ch.Lakshmi Priyanka	42
2	2021012	Seelam Hema	44
3	2021018	Y Baby Sowmya	42
4	2022019	A Amrutha Durga	38
5	2022021	A Kanaka Durga	34
6	2022022	A Neelima	40
7	2022024	B Dhana Raju	38
8	2022025	Ch P V Rakesh	28
9	2022026	Ch Stanley Peter	34
10	2022027	G Puspha Lalitha	40
11	2022029	K S Venkata Sandeep	42
12	2022030	L Suhasini	40
13	2022033	M Anitha	42
14	2022035	P Harshitha	36
15	2022036	Vanamadi Vasu	38
16	2022037	Villuri Hasini	40
17	2025074	Bandi Ramyasri	38
18	2025078	G Lalitha Devi	42
19	2025079	G Raghuvindra Varma	44
20	2025082	G Anusha	42
21	2025083	I Kalyani	40
22	2025085	J N Siva Prasad	32
23	2025088	K Tejeswari	42
24	2025090	K Raghavendra Rao	40
25	2025092	K Nageswari	38
26	2025094	P Hemanth Prakash	32
27	2025095	S Leela Bhavani	40
28	2025098	Undurthi Sailu	42
29	2025099	Varada Navya	42
30	2025101	Y Varshi Satya Sri	36

Other Details:

Duration of Course	:	30 Hours
Classes starting Date	:	01-07-2022
Classes ended Date	:	05-08-2022
Exam conducted on	:	18-08-2022
Classes Timings	:	9:00 AM – 10:00 AM
Resource Persons	:	1. Sri K. Siva Krishna
		2. Smt. B.K.V Rama Lakshmi
		3. Sri. D.R.R Sudhakar

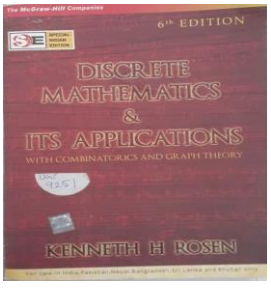
Conclusion :

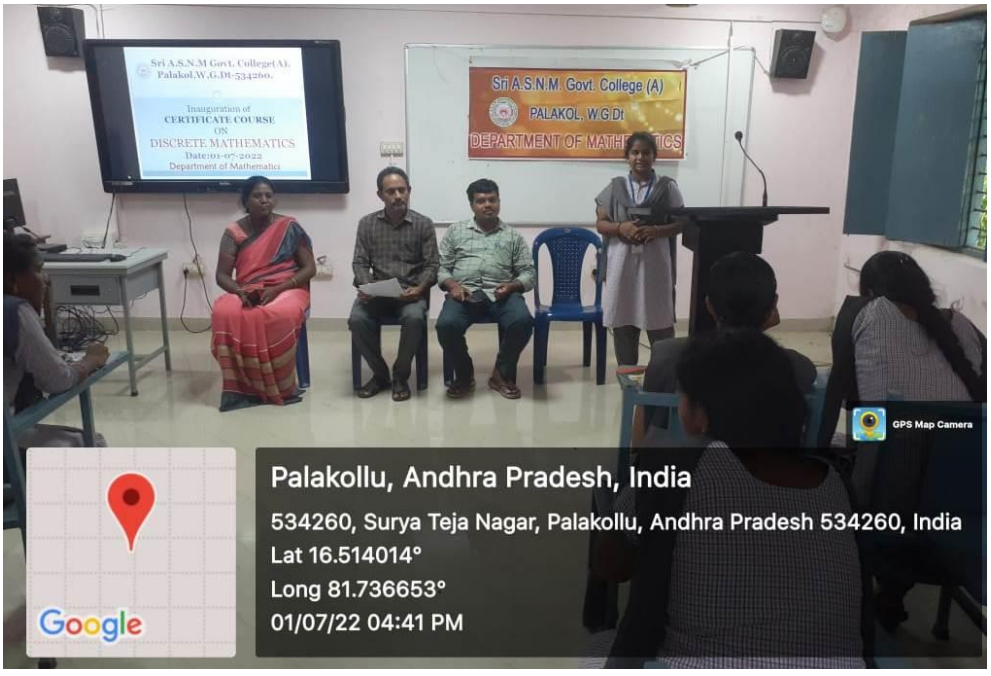
This certificate course develops the mathematical concepts and technique which should serve as a preparation for more advanced quantitative courses.

References :

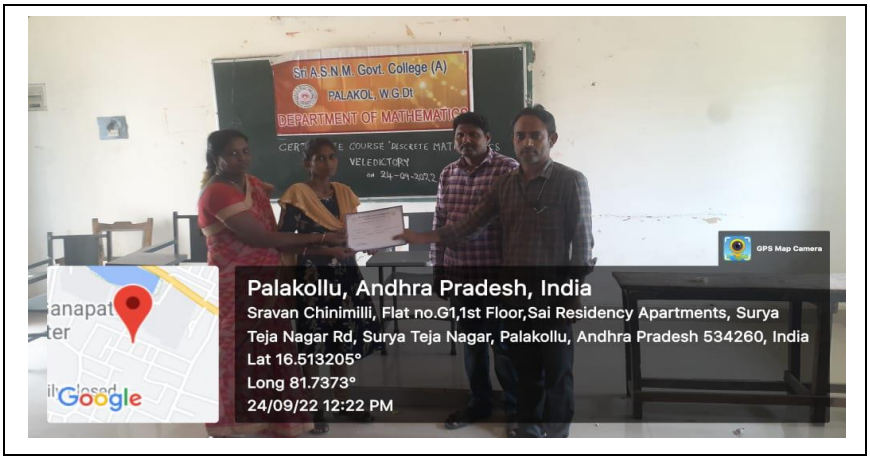
DISCRETE
MATHEMATICS
&
ITS APPLICATIONS
WITH COMBINATORICS AND GRAPH THEORY

BY KENNETH H ROSEN



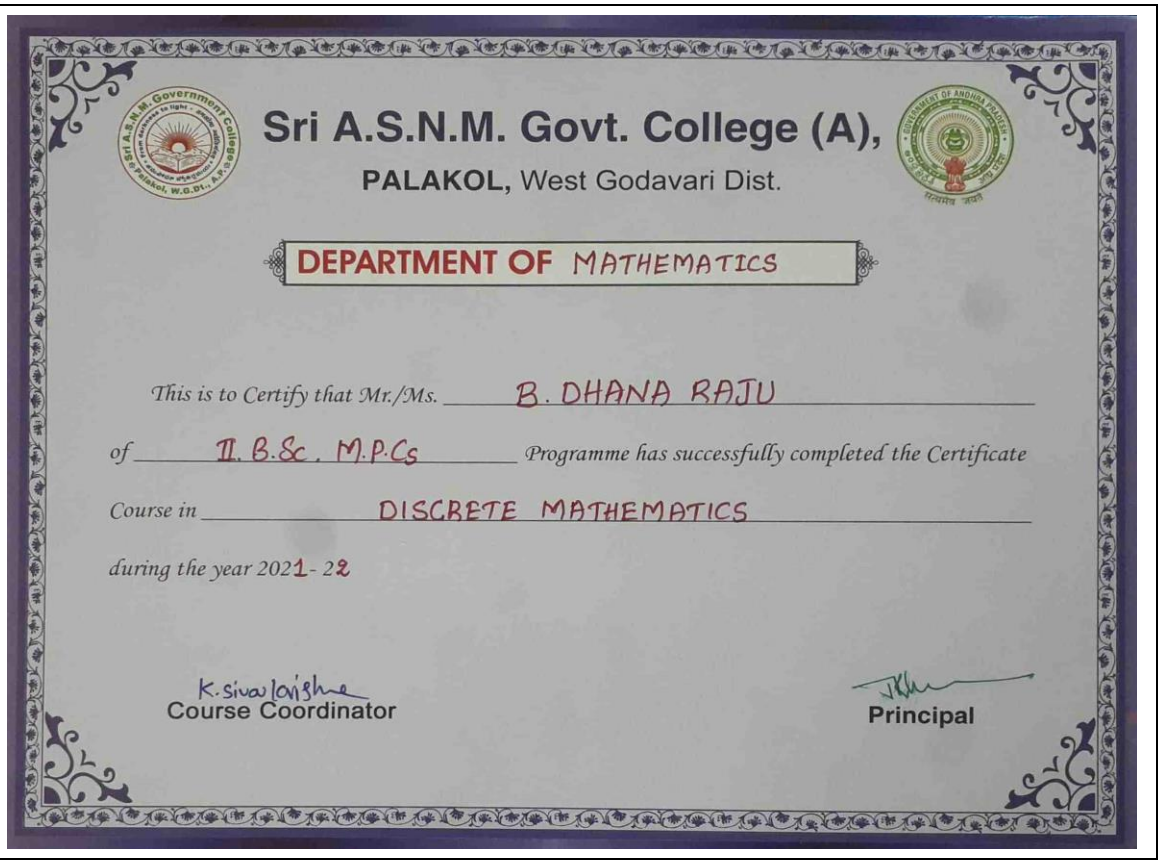


PROGRAM INAUGARATION PHOTOS



VELADICTORY PROGRAM PHOTOS

MODEL CERTIFICATE



Sri A.S.N.M. Govt. College (A),

PALAKOL, West Godavari Dist.

DEPARTMENT OF MATHEMATICS

This is to Certify that Mr./Ms. B. DHANA RAJU

of II. B.Sc. M.P.Cs *Programme has successfully completed the Certificate*

Course in DISCRETE MATHEMATICS

during the year 2021-22

K. sivalakshmi
Course Coordinator

Principal