S.T.S.N. Govt. Degree College
KADIRI - 515591
Sri Sathya Sai Dist., A.P.
Affiliated to Sri Krishnadevaraya University, Ananthapuramu.

DEPARTMENT OF MATHEMATICS

Certificate course – **Number Theory**

2021-22

Kadiri

Date:14/3/2022

From
Department of Mathematics
STSN Govt.Degree College
Kadiri.

To
The Principal
STSN Govt.Degree College
Kadiri.

Sir/Madam,

Sub:Requisition to counduct Add-on Course on Number Theory permission-Reg.

We , the Department of Mathematics, requesting you to give permission to conduct add-on course on Number Theory from 17.3.2022 to 16.4.2022 to the second year M.P.Cs students.

Thanking you Madam

Yours faithfully

(A. Sivaprasad)

Permitted

PRINCIPAL
STSN Govt.DEGREE COLLEGE
KADIRI - 515 591
Sri Sathya Sai (Dist)

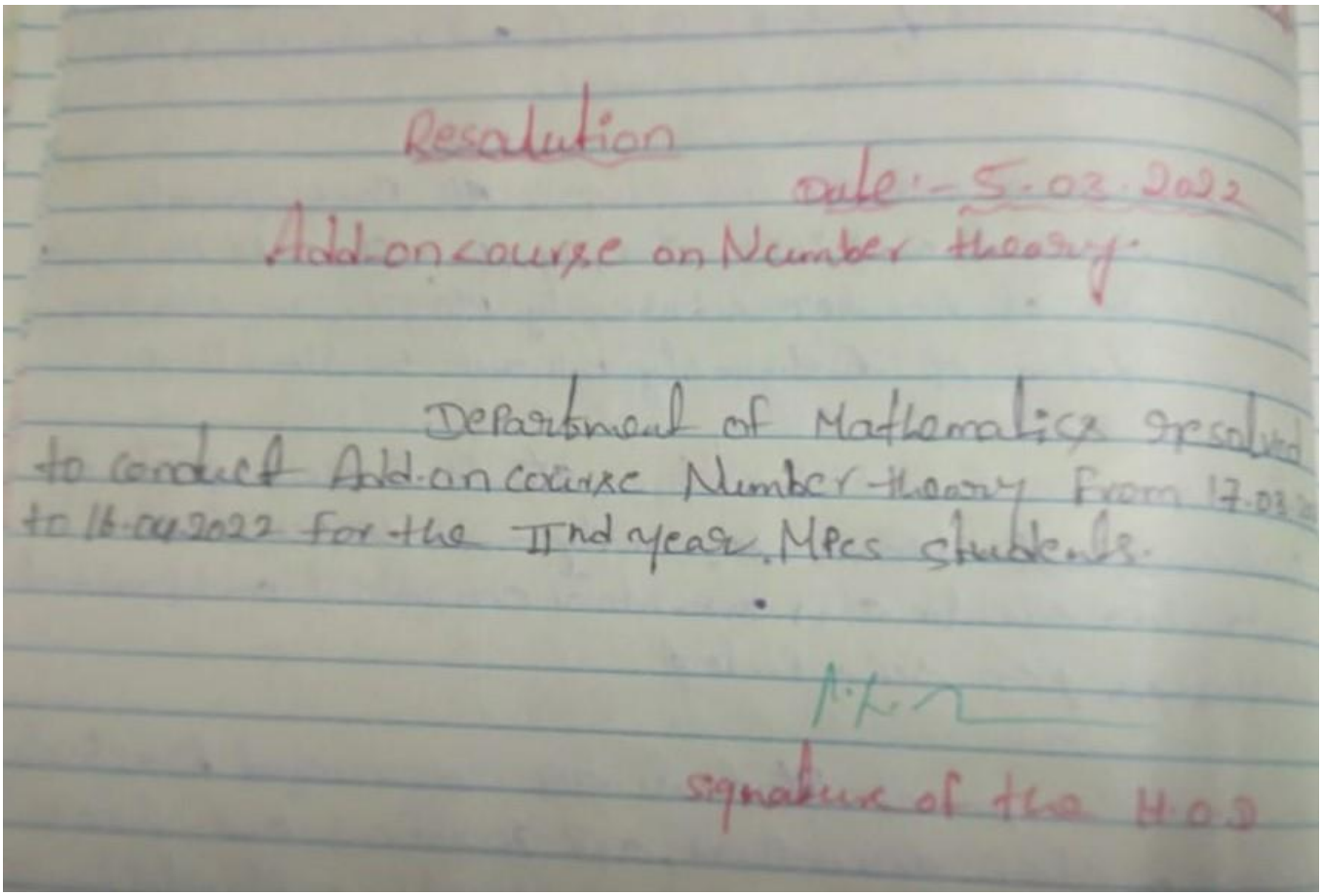
Kadiri,

Date: 14/3/2022

Circular

The Department of Mathematics decided to conduct add-on Course on Number Theory from 17/3/2022 to 16/4/2022(Total 30 hours, Every Day Timing 04.00 P.M. to 05.00 P.M.) to the B.Sc. IInd year(M.P.Cs) students. The II Year Mathematics Students are instructed to enroll their names in this course to P.Sivaprasad, Lecturer in Mathematics.

Signature of the Lecturer


Resolution

Date:- 5.03.2022

Add-on course on Number theory.

Department of Mathematics resolved to conduct Add-on course Number theory From 17.03.22 to 16.04.2022 for the IInd year. MPCs students.

signature of the H.O.D

STSN Govt. Degree College Kadiri, Ananthapuramu
Department of Mathematics
Syllabus of add-on course on Number Theory

Course Objectives:
To present a rigorous development of Number Theory using axioms, definitions, examples, theorems and their proofs.

Topical Outline of the Course Content:

Module 1: Divisibility and Primes – 1:
Well-ordering Principle – Division algorithm, Euclid's algorithm, linear Diophantine equation.

Module 2: Divisibility and Primes – 2 :
Prime numbers, fundamental theorem of arithmetic.

Module 3: Congruences – 1:
Congruence, Properties of Congruence, Linear Congruence, Simultaneous Linear Congruences, Chinese Remainder Theorem.

Module 4: Congruences – 2:
Fermat's Little Theorem, Wilson's theorem, Pseudo-primes.

Module 5: Number theoretic functions:
Greatest Integer Function, Euler's φ-function, Arithmetic Functions, Mobius Function, Dirichlet product.

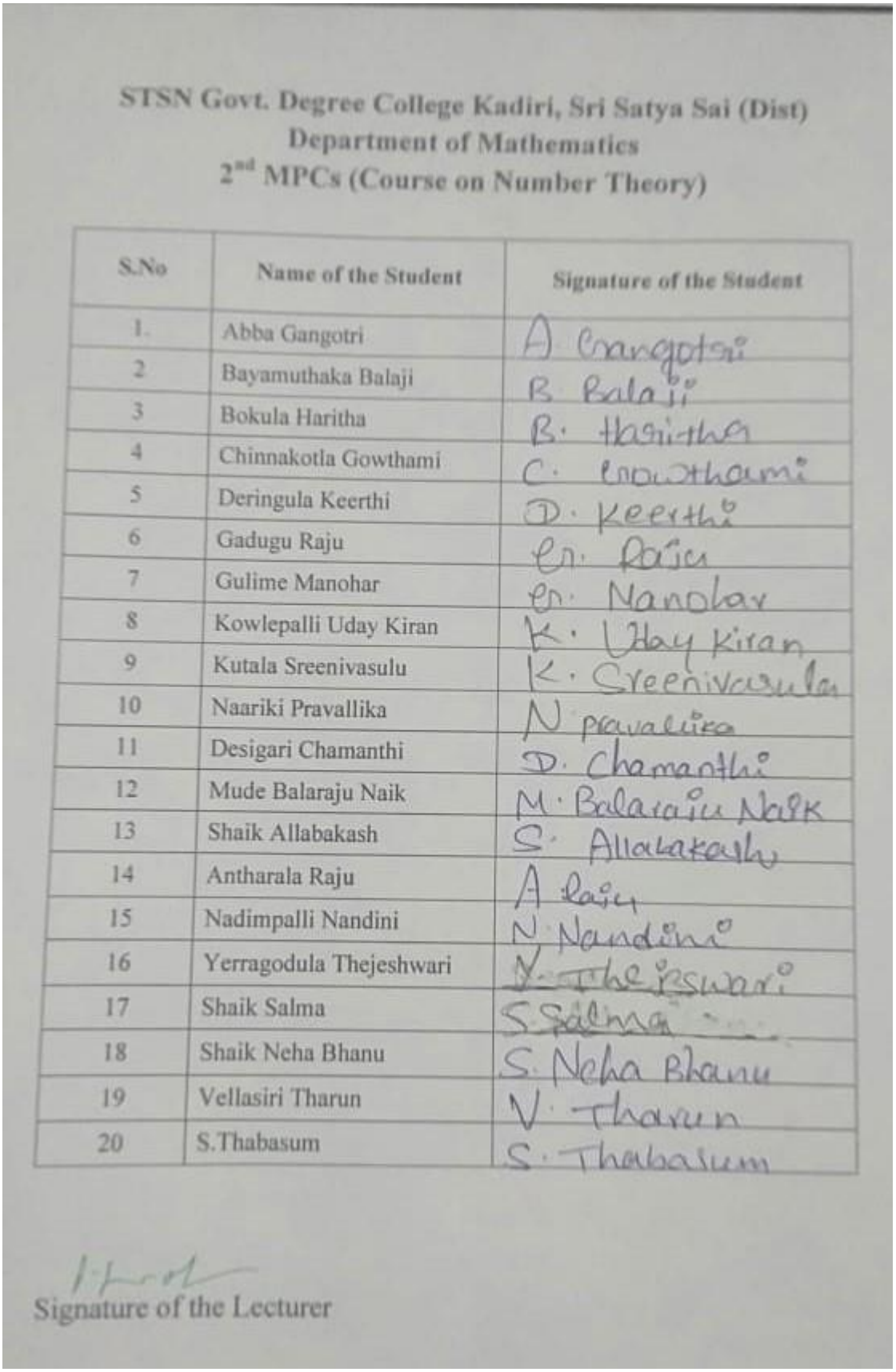
Student Learning Outcomes. Students will be able to :

1) effectively express the concepts and results of Number Theory.
2) construct mathematical proofs of statements and find counter examples to false statements in Number Theory.
3) collect and use numerical data to form conjectures about the integers.
4) understand the logic and methods behind the major proofs in Number Theory.
5) work effectively as part of a group to solve challenging problems in Number Theory.

Reference Books:

1. K. Rosen, Elementary Number Theory and its Applications (5^{th} Edition), Addison-Wesley (2005).
2. T. Koshy, Elementary Number Theory with Applications, Harcourt/Academic Press (2002)
3. G. Andrews, Number Theory, Dover Publications (1994)

STSN Govt. Degree College Kadiri, Sri Satya Sai (Dist)
Department of Mathematics
2nd MPCs (Course on Number Theory)



STSN Govt. Degree College Kadiri, Sri Satya Sai (Dist)
Department of Mathematics
2nd MPCs (Course on Number Theory)

S.No	Name of the Student	Signature of the Student
1.	Abba Gangotri	A Gangotri
2	Bayamuthaka Balaji	B Balaji
3	Bokula Haritha	B. Haritha
4	Chinnakotla Gowthami	C. Gowthami
5	Deringula Keerthi	D. Keerthi
6	Gadugu Raju	G. Raju
7	Gulime Manohar	G. Manohar
8	Kowlepalli Uday Kiran	K. Uday Kiran
9	Kutala Sreenivasulu	K. Sreenivasulu
10	Naariki Pravallika	N pravallika
11	Desigari Chamanthi	D. Chamanthi
12	Mude Balaraju Naik	M. Balaraju Naik
13	Shaik Allabakash	S. Allabakash
14	Antharala Raju	A Raju
15	Nadimpalli Nandini	N Nandini
16	Yerragodula Thejeshwari	Y. Thejeshwari
17	Shaik Salma	S Salma
18	Shaik Neha Bhanu	S. Neha Bhanu
19	Vellasiri Tharun	V. Tharun
20	S.Thabasum	S. Thabasum

Signature of the Lecturer

Brief Report

Number theory is a branch of pure mathematics devoted to the study of the natural numbers and the integers. As it holds the foundational place in the discipline, Number theory is also called "The Queen of Mathematics". The number theory helps discover interesting relationships between different sorts of numbers and to prove that these are true.

The Students of Mathematics should know about the Fundamentals in Number Theory in addition to the regular domain courses. Taking this fact in view Department of Mathematics has planned to conduct an add-on course on Number Theory. In this course, we discussed about Divisibility, Primes, Congruences, Number theoretic functions etc. The faculty member P.Sivaprasad, Lecturer in Mathematics has conducted this add-on course for 30 hours from 17-03-2022 to 16-04-2022 for 20 enrolled students from II MPCs . Class timings were 4:00 PM to 5:00 PM, and the faculty [illegible] Lecturer in Mathematics [illegible] P.Sivaprasad have acted faculty for this course.

STSN Govt. Degree College Kadiri, Sri Satya Sai (Dist)
Department of Mathematics
2nd MPCs (Course on Number Theory)

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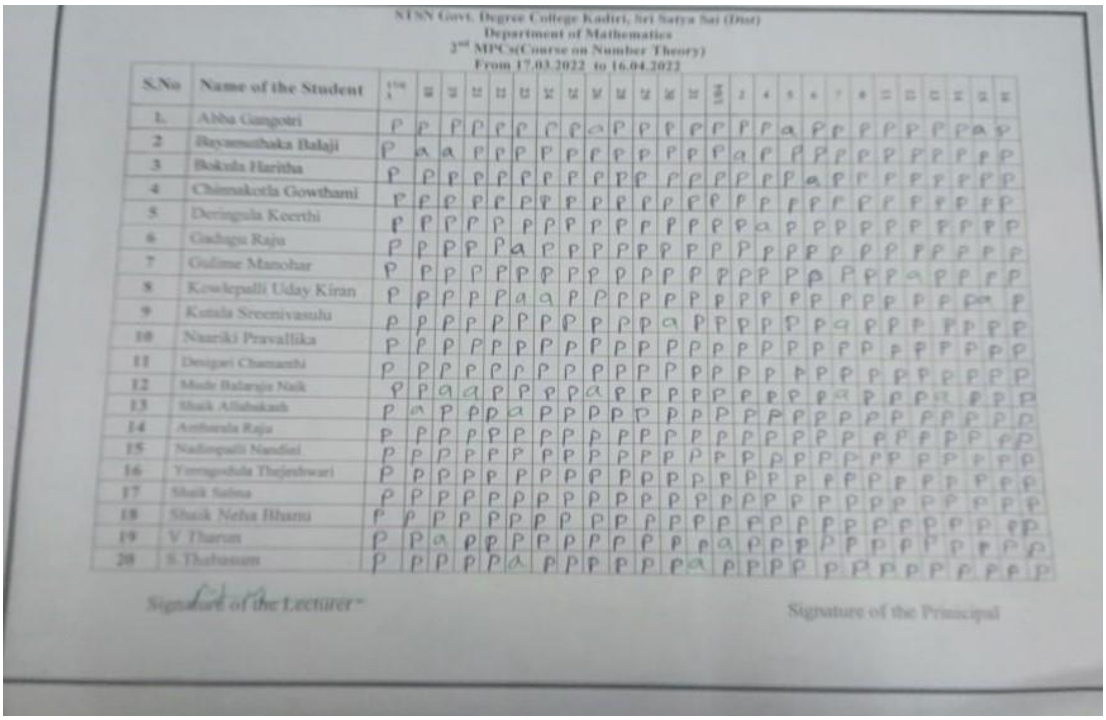
13	Shaik Allabakash	S. Allabakash
14	Antharala Raju	A Raju
15	Nadimpalli Nandini	N Nandini
16	Yerragodula Thejeshwari	Y. Thejeshwari
17	Shaik Salma	S Salma
18	Shaik Neha Bhanu	S. Neha Bhanu
19	Vellasiri Tharun	V. Tharun
20	S.Thabasum	S. Thabasum

Signature of the Lecturer



STSN Govt. Degree College Kadiri, Sri Satya Sai (Dist)
Department of Mathematics
2nd MPCs(Course on Number Theory)
From 17.03.2022 to 16.04.2022

S.No	Name of the Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.	Abba Gangotri	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A
2	Bayanuthaka Balaji	P	A	A	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P
3	Bokula Haritha	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
4	Chinnakotla Gowthami	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
5	Deringula Keerthi	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
6	Gadugu Raju	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
7	Gulime Manohar	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
8	Kowlepalli Uday Kiran	P	P	P	P	P	A	A	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
9	Kotala Sreenivasulu	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	P	P	P	P	P
10	Nauriki Pravallika	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
11	Devigari Chamanthi	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
12	Mude Balaraju Naik	P	P	A	A	P	P	P	P	A	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
13	Shaik Allabakash	P	A	P	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
14	Anthuvala Raja	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
15	Nadimpalli Nandini	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
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17	Shaik Salma	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
18	Shaik Neha Bhanu	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
19	V Tharun	P	P	A	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
20	S Thabassum	P	P	P	P	P	A	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P

Signature of the Lecturer

Signature of the Principal

STSN Govt. Degree College Kadiri, Ananthapuramu
Department of Mathematics
Examination on Number TheoryName of

the student: _____ Group:___

Reg. Number: _____

1. If a and b are two integers, then ∃ some integers x and y such that [ ]

(a) gcd(a, b) = ax+by (b) gcd(a, b) = ax –by

(c) gcd(a, b) = ax^n+by^n (d) gcd(a, b) = $(ax +by)^n$

2. An efficient way of obtaining the gcd is known as____. [ ]

(a) Wellordering principle (b)Division Algorithm

(c)Euclid's Algorithm (d)None of above

3. Two consecutive terms of a Fibonacci sequence are___. [ ](a)Co-

prime (b)Composite

(c)Inverses (d)None of these

4. Which of the congruence statements is false? [ ](a)25

 15(mod5) (b)13 10(mod3)

(c)25 9(mod4) (d)10 3(mod2)

5. For modulus m, if every integer is congruent to an element of set S and S is smallest such set then [ ]

(a) S is complete residue system (b)S is least residue system(c)S is

complete modulo system (d)S is least modulo system

6. The representation of a number into product of primes is____. [ ]

(a)Separate (b) Unique up to the order of factors

(c)Not unique (d) Infinite Number

7. Which name matches the statement if a|bc and (a, b) = 1, then a|c? [ ]

(a)Euclid's Lemma (b) Fermat's Theorem

(c)Division Algorithm (d) Euclidean Algorithm

8. Linear congruence is of the form____. [ ]

(a)ax □b(mod m) (b)ax = b(mod m)

(c)ax^2 + bx =c (mod m) (d)Both a and b

9. Which of the following is a valid solution to the congruence 2x □1(mod5)? [ ]

(a)x □3(mod5) (b)x □1(mod5)

(c)x □4(mod5) (d)x □ 5(mod5)

10. If d = (a, m), then the congruence ax □b(mod m) has a solution if [ ]

(a) d|b (b)b| d

(c) d|b-am (d)None of these

11. Suppose that m_j are pair wise relatively prime and a_j are arbitrary integers(j=1, … , k), then ∃ solutions x to the simultaneous congruences x □a_j(mod m_j) s.t. the solutions x are__.
[ ]

(a)Congruent Modulo M=$m_1 . m_2 \ldots m_k$ (b)Congruent Modulo $M = \sum_{i=1}^{k} m_i$

(c)Congruent Modulo m_1 (d)Both a and b

12. Which of the statements is false? [ ]

(a)There is no pattern in prime numbers (b) No formula exists for prime numbers

(c)Both a and b (d) None of these

13. Which theorem states that "If p is prime, then (p-1)! □-1(mod p)."? [ ]

(a)Dirichlet's Theorem (b)Wilson's Theorem

(c)Euler's Theorem (d)Fermat's Little Theorem

14. According to fundamental theorem of algebra, every n degree polynomial_____. [ ]

(a)At least n roots (b)At most n roots

(c)Exactly n roots (d) n-1 roots

15. A congruence of the form x^2□□a(mod m) is called_____. [ ]

(a)Linear congruence (b) Quadratic congruence

(c)Cubic congruence (d) Polynomial congruence

Number Theory

CERTIFICATE

OF COMPLETION

This certificate is awarded to

MPCs

for successfully completion of add-on course on **Numbers Theory** conducted by **Department of Mathematics, STSN Govt. Degree College ,Kadiri Sri Satya Sai (Dist) 17**-3-2022 to 16-4-2022.

SIGNATURE OF INCHARGE SIGNATURE OF PRINCIPAL