

**SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM**



Department of Mathematics

**CERTIFICATE COURSE IN
Number Theory**

**Add on / Certificate programs offered during the
year 2022-23**



S.A.S. GOVERNMENT DEGREE COLLEGE

(AFFILIATED TO ADIKAVI NANNAYA UNIVERSITY, RAJAMAHENDRAVARAM)

Phone: 08818 252189, E-mail: narayananapuram.jkc@gmail.com

NARAYANAPURAM, W.G DISTRICT-534406



CERTIFICATE COURSE AT A GLANCE

1. TITLE OF THE COURSE : **Number Theory**
2. LEVEL OF THE COURSE : **UG**
3. NAME OF THE INSTRUCTOR : **Dr P Babu Rao**
4. DURATION OF THE COURSE: **30 HOURS**
5. DATE OF COMMENCEMENT : **12.06.2023**
6. DATE OF CLOSURE : **18.07.2023**
7. TIME OF CONDUCT OF THE CLASSES: **09:00 PM – 10:00 AM**
8. NUMBER OF STUDENTS ENROLLED FOR THE COURSE: **12**
9. NUMBER OF STUDENTS COMPLETED THE COURSE: **10**
10. ASSESSMENT CRITERION: **EVALUATION TEST**





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Minutes of Departmental Meeting on Certificate Course

The In Charge of the Department of Mathematics met in the principal's chamber under the chairperson ship of Dr T K Visveswara Rao at 2:30 PM on Dt: 06-06-2023 discussed and resolved as detailed here under.

After the through discussion on the agenda of conducting certificate course as per the departmental action plan, it was resolved to

1. Conduct a certificate course titled "Number Theory" with a duration of 30 hours during the working days
2. Frame the syllabus and regulations for the successful completion of certificate course
3. Conduct the examination after the completion of course and issue certificate to the qualified students
4. Serve notice to the students well in advance for the enrolment into this course
5. Commence the course on the date fixed obtaining due permission from the chair.
6. Set 40% of marks as eligibility for the completion of the course.

B. N. Rao
Signatures of the faculty
Incharge

Department of Mathematics
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406



T. K. Visveswara Rao
Principal

PRINCIPAL
SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh

PERMISSION LETTER FOR CERTIFICATE COURSE

NARAYANAPURAM,

Dt. 08.06.2023

From
The In-charge,
Department of Mathematics,
SAS GDC, Narayananapuram.

To
The Principal,
SAS GDC, Narayananapuram.

Sir,

Sub: Department of Mathematics, SAS Govt. Degree College,
Narayananapuram-Conduct of Certificate course in **Number Theory** (30 hours)
-Accordance of permission requested-Reg.

Ref: Minutes of the departmental meeting dated 06-06-2023

Adverting to the subject, I wish to submit to your kind self that the Department of Mathematics is planning to conduct a Certificate course in "**Number Theory**" with 30 hours duration for the students of our college as well as the general public. A resolution was passed to this effect in the Departmental meeting dated 06-06-2023. Hence, I request you to kindly accord permission to conduct the same from 12-06-2023 onwards.

Thanking you sir.

Yours faithfully


Department of Mathematics
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406

Enclosures

1. A xerox copy of the minutes of
Departmental meeting dt. 06.06.2023
2. A copy of syllabus



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NARAYANAPURAM, W.G DISTRICT-534406



PROCEEDINGS OF THE PRINCIPAL, SAS GOVT. DEGREE COLLEGE, NARAYANAPURAM

DATE: 09.06.2023

To

The In-charge,
Department of Mathematics,
SAS GDC
Narayanapuram.



Sir/Madam,

Sub: SAS Govt. Degree college, Narayanapuram- Conduct of certificate course in Number Theory – Permission accorded- Reg.

Adverting to the subject, I hereby draw the kind attention of the in-charge of department of Mathematics of this college, that a decision was taken in the staff council meeting 09.06.2023 dated after much discussions and deliberation to approve and accord permission for the conduct of a certificate course Number Theory with 30 hours duration for the general public as well as the students of our college from dt. 12-06-2023

You are further instructed to make all the necessary preparations and arrangements for the commencement of the course on dt. 12-06-2023.


PRINCIPAL

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SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh



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NARAYANAPURAM, W.G DISTRICT-534406



NOTICE

NARAYANAPURAM

Dt.10.06.2023

All the students of SAS Govt. Degree college, Narayanapuram are hereby informed that the Department of Mathematics is intending to conduct a certificate course in "Number Theory" from 12-06-2023 onwards. The required permission from the honourable Principal of the college has been obtained. Hence the students who are interested in enrolling themselves for the course may please contact the in-charge of the department for further details on or before dt.12-06-2023.

Principal

PRINCIPAL

SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh

In-charge of the dept.

Department of Mathematics
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406





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NARAYANAPURAM, W.G DISTRICT-534406



Department of Mathematics

(CERTIFICATE COURSE IN Number Theory)

Certificate Course

Syllabus

2022-23



NUMBER THEORY

Unit I: Divisibility periods)

(10

- 1.1 Introduction and basic properties of divisibility.
- 1.2 Well ordering principle Definition of Divisors
- 1.3 Division algorithm and related problems.
- 1.4 GCD, Euclidean Algorithm, problems,

Unit II: Primes periods)

(10

- 2.1 Relatively prime definitions, Euclid's lemma and Fundamental theorem of arithmetic.
- 2.2 The number of Divisors of a positive integer N.
- 2.3 Highest power of a prime number containing $n!$ Problems.
- 2.4 Bracket function.

Unit III: Congruences periods)

(10

- 3.1 Congruence modulo n definition,
- 3.2 Congruence classes, linear congruence definition, Examples, theorems, problems.

3.3 Inverse modulo m.
 3.4 Euler's \emptyset function definition and theorems.
 3.5 Fermat's little theorem and Wilson's theorem



Prescribed Text book:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	V Venkateswara Rao, N. Krishna Murthy, BVSS Sarma and S Anjaneya Sastry.	A Textbook of B.Sc Mathematics Vol – I for degree classes.	S – Chand & Company Ltd.	1988

Reference books:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	A Anjaneyulu	A Text book Mathematics – Vol I	Deepthi Publications.	1998

Model Paper

TITLE OF THE PAPER : NUMBER THEORY

Time: 3hrs.

Max. Marks: 75

Section – A

Answer any FIVE questions

5x5=25

1. If $a = 2210, b=493$ find (a, b) and hence $[a,b]$.
2. Prove that every odd integer is of the form $4n+1$ or $4n-1$.
3. State and prove Euclid's lemma.
4. Find the number of divisors and sum of the divisors of 14553.

5. Solve the linear congruence $16x \equiv 25 \pmod{19}$
6. Find $\phi(126)$



Section – B

Answer ALL questions.

(5 x 10 = 50 marks)

Unit - I

9. State and Prove Division algorithm for integers

(OR)

10. Prove that $(a, b) = 1$ if and only if there exist $x, y \in \mathbb{Z}$ such that $ax + by = 1$.

Unit - II

11. State and Prove Fundamental theorem of arithmetic.

(OR)

12. Prove that the number of primes is Infinite.

Unit – III

13. State and prove Fermat's theorem

(OR)

14. Show that 17 is a prime by showing that $16! \equiv -1 \pmod{17}$.

(P.T.O)



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NARAYANAPURAM, W.G DISTRICT-534406

Department of Mathematics

2022-23

Certificate Course - Student Attendance Register



Sl.No.	Roll No.	Name of the Student	12/6/2023	13/6/2023	14/6/2023	15/6/2023	16/6/2023	17/6/2023	18/6/2023	19/6/2023	20/6/2023	21/6/2023	22/6/2023
01	203557101001	A. Soma Shekar	P	P	P	A	P	P	P	A	P	P	P
02	203557101002	B. Hemanth Kumar	A	A	P	P	A	P	P	P	A	A	A
03	203557101003	Ch. Prasanna Kumar	P	A	A	P	P	P	A	P	P	A	
04	203557101005	G. Sai	P	P	P	P	P	P	P	P	P	P	
05	203557101006	G. Madhu Babu	A	P	P	P	A	A	P	P	P	P	
06	203557101007	J. Naga Babu	P	P	P	P	P	P	P	P	P	P	
07	203557101008	K. D. S. Naga Sai	P	P	P	P	P	P	P	P	P	P	
08	203557101009	K. V. D. Bhavani	P	P	P	P	P	P	P	P	P	P	
09	203557101010	P. Chiranjeevi	P	P	P	P	P	P	P	P	P	P	
10	203557101011	P. Siva Sai Anand	P	D	A	P	D	A	P	R	A	P	
11	203557101012	Sk. Ibrahim	P	P	P	A	P	P	A	P	P	P	
12	203557101013	S.V. Satish	P	P	P	P	P	P	P	P	P	P	
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Signature of the Lecturer				 Incharge Department of Mathematics S.A.S. GOVERNMENT DEGREE COLLEGE NARAYANAPURAM-534406									



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Department of Mathematics

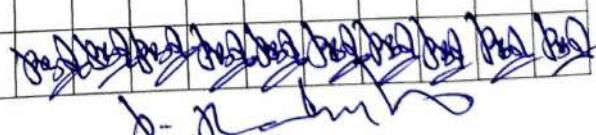
2022-23



Certificate Course - Student Attendance Register

Sl.No.	Roll No.	Name of the Student	23/6/2023	24/6/2023	26/6/2023	27/6/2023	28/6/2023	30/6/2023	01/07/2023	03/07/2023	04/07/2023	05/07/2023
21	203557101001	A. Soma shekar	P	P	P	P	P	P	P	A	P	P
22	203557101002	B. Hemanth Kumar	P	A	P	P	P	A	P	A	P	P
23	203557101003	Ch. Prasanna Kumar	P	P	P	P	P	P	P	P	P	P
24	203557101005	G. Sai	P	P	P	P	P	P	P	P	P	P
25	203557101006	G. madhu babu	A	P	P	A	P	A	P	P	P	N
26	203557101007	J. Naga babu	P	P	P	P	P	P	P	P	P	P
27	203557101008	KDS. Naga Sai	P	P	P	P	P	P	P	P	P	P
28	203557101009	KVD. Bhavani	P	P	P	P	P	P	P	P	P	P
29	203557101010	P. chixonJeevi	P	A	P	P	P	P	P	P	A	P
30	203557101011	P. Siva Sai Anand	P	P	P	P	P	P	P	P	P	P
31	203557101012	S.K. Ibrahim	P	P	P	P	P	P	P	P	P	P
32	203557101013	SV. Sofish.	P	P	P	P	P	A	A	P	P	P
33												
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Signature of the Lecturer



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NARAYANAPURAM, W.G DISTRICT-534406

Department of Mathematics

2022-23

Certificate Course - Student Attendance Register



Sl. No.	Date	No. of Students Present	No. of Students Absentees	Signature of the Lecturer
01	12/06/23	10	2	
02	13/06/23	10	2	
03	14/06/23	10	2	
04	15/06/23	10	2	
05	16/06/23	10	2	
06	17/06/23	10	2	
07	19/06/23	10	2	
08	20/06/23	11	1	
09	21/06/23	10	2	
10	22/06/23	10	2	
11	23/06/23	11	1	
12	24/06/23	10	2	
13	26/06/23	12	0	
14	27/06/23	11	1	
15	28/06/23	12	0	
16	30/06/23	9	3	
17	01/07/23	12	1	
18	03/07/23	11	1	
19	04/07/23	10	2	
20	05/07/23	11	1	

J. M. J. M.
Incharge
Department of Mathematics
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NARAYANAPURAM, W.G DISTRICT-534406

Department of Mathematics

2022-23

Certificate Course - Student Attendance Register



SL.No.	Roll No.	Name of the Student	06/07/23	07/07/23	10/07/23	11/07/23	12/07/23	13/07/23	14/07/23	15/07/23	17/07/23	18/07/23
01	203557101001	A. Soma Shekhar	P	P	P	P	P	P	P	P	P	P
02	203557101001	B. Hemanth Kumar	P	P	P	P	P	A	A	P	P	P
03	203557101003	Ch. Prasanna Kumar	P	P	P	P	P	P	P	P	P	P
04	203557101005	C. Sai	P	P	P	P	P	P	A	P	P	P
05	203557101006	G. Madhu Babu	P	A	P	P	A	P	P	P	P	P
06	203557101007	J. Naga Babu	P	P	P	P	P	P	P	P	P	P
07	203557101008	K.D. Naga Sai	P	P	P	P	P	P	P	P	P	P
08	203557101009	K.V.D. Bhavani	P	P	P	P	P	P	P	P	P	P
09	203557101010	P. Chiranjeevi	P	P	P	P	P	P	P	P	P	P
10	203557101011	P. Siva Sai Anand	P	P	A	P	P	P	P	P	P	P
11	203557101012	S.F. Ibrahim	P	P	P	P	P	P	P	P	P	P
12	203557101013	S.V. Salim	P	P	P	P	P	P	P	A	P	P
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Signature of the Lecturer



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Department of Mathematics

2022-23

Certificate Course - Student Attendance Register



Sl. No.	Date	No. of Students Present	No. of Students Absentees	Signature of the Lecturer
21	06/07/23	12	0	
22	07/07/23	11	1	
23	08/07/23	11	1	
24	11/07/23	12	0	
25	12/07/23	11	1	
26	13/07/23	11	1	
27	14/07/23	10	2	
28	15/07/23	12	0	
29	17/07/23	11	1	
30	18/07/23	12	0	
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Incharge
Department of Mathematics
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406



SAS Government Degree College Narayananapuram



Department of Physics

(CERTIFICATE COURSE IN Mathematics)

Brief Report on Certificate Course

In the Academic Year 2022-23 certificate course programme on Certificate course in Number Theory **was** conducted in the Department of Mathematics, a good number of students were admitted for this certificate course. Through this course students get knowledge about Number Theory. Assessment was done in the form of written exam.

Tee

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Head Dept. Of Mathematics

Incharge

Department of Mathematics
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