REF: MSRCASC/MATH/2021-2022/005   Date:29-01-2022

CIRCULAR

DEPARTMENT OF MATHEMATICS

This is to inform that, Department of Mathematics is organizing Value Added Course on "**Number –Theoretic Function**" from 5th February 2022 to 7th April 2022 for the students of 1st year B.Sc(EMCs) between 2:00 PM and 3:00 PM.

Interested students can enroll their names with event coordinator Mrs. Haritha A.

HOD
HEAD OF THE DEPARTMENT
MATHEMATICS
RAMAIAH COLLEGE
OF ARTS, SCIENCE & COMMERCE
BANGALORE-560054

PRINCIPAL
Principal,
M.S. Ramaiah College of Arts, Science & Commerce
MSRIT Post, MSR Nagar
Bangalore - 560 054

RAMAIAH
College of Arts, Science & Commerce

Value Added Course on

NUMBER - THEORETIC FUNCTION

Organized by

DEPARTMENT OF MATHEMATICS

Program Schedule

Date : 05-02-2022 to 07-04-2022

Time : 2:00 pm to 3:00 pm

Venue: Room No. 312

PATRONS

Dr.M.R.Jayaram Chairman GEF

Sri.M.R.Janakiram Director GEF

Sri.M.R.Kodandaram Director GEF

Sri. B.S Ramaprasad Chief Executive GEF(E & GS)

Sri.G.Ramachandra Chief of Finanace GEF(E & GS)

ORGANIZING COMMITTEE MEMBERS

Mr.Ravindranath.K

Mrs.Haritha.A

Mrs.Thulasi R Mudakavi

RESOURCE PERSON

Thulasi Rajeev Mudakavi

Assistant Professor

Dept of Mathematics

MSRCASC

Event co-ordinator

Mrs.Haritha.A

COURSE OUTLINE

- Division algorithm
- Fundamental theorem of Arithmetic
- Linear congruences and the Chinese Remainder theorem
- Sum and number of divisors
- Greatest integer function
- An application to the Calendar

OBJECTIVE

The course is designed to introduce basic ideas of number theoretic functions. The module will illustrate some important topics on the theory of congruences and its applications to Calendar problems.

OUTCOME

Through this value added course students understood division algorithm, linear congruences, residue classes and the Chinese remainder theorem. Students used the concept of divisors, greatest integer function to understand the application to calendar.

FREE REGISTRATION

ABOUT THE COLLEGE

Ramaiah College of Arts, Science and Commerce was established in 1994 by our founder Late Dr.M.S Ramaiah offering both under graduate and postgraduate degrees under Bangalore City University in Arts, Science, Commerce and Management streams. The college is approved by AICTE, New Delhi, recognized by the Government of Karnataka. The college is re accredited 'A' grade by NAAC.

ABOUT THE DEPARTMENT

The Department of Mathematics was established since the inception of the college in 1994. The department is strong with all the members of the faculty having more than 10 years of experience. We go by the vision and mission of the college. Department has approximately 220 students. Apart from following the curriculum, the department concentrates in training the students to face all competitive exams boldly and confidently. We encourage the students who attend workshops, seminars in other colleges.

DEPARTMENT OF MATHEMATICS

REPORT ON VALUE ADDED COURSE CONDUCTED FROM 5th FEBRUARY 2022 TO 7th APRIL 2022

Title: Number – Theoretic function

Date: 05/02/2022 to 07/04/2022

Venue: Room No - 312

Participants: 1st year B.Sc(EMCs) students.

Resource Person: Thulasi Rajeev Mudakavi

Number of Students: 22

Event Co-Ordinator: Mrs. Haritha A

Objective: The course is designed to introduce basic ideas of number theoretic functions. The module will illustrate some important topics on the theory of congruences and its applications to Calendar problems.

Department of Mathematics organized value added course on Number – Theoretic function 5th February 2022 to 7th April 2022 for the students of 1st year B.Sc(EMCs) in room no.312. The value added course was inaugurated by Dr.A.Nagarathna, Principal under the patronage of Sri.M.R. Janakiram (Honarable Director, Gokula Education Foundation), Sri.M.R.Kodandaram (Honarable Director, Gokula Education Foundation) and Sri.Ramprasad (Chief Executive, Gen Science, Gokula Education Foundation). The resource person to the course was Mrs.Thulasi Rajeev Mudakavi. This course was conducted for 30 hrs.

The registration process started on 1st February 2022. The program started at 11:00am on 5th February 2022 followed by the inauguration and then the sessions began with the brief introduction of the resource person and few words delivered by principal madam.

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The session started with the introduction to history of number theory where it started with Babylonian Mathematics, Pythagoras, Thales, Euclid, Hippasus, Greek Mathematics, Aryabhata, Fermat, Euler and their great contribution to the theory of numbers and its evolution over the years.

She explained the concept of division algorithm, Diophantine equation, linear congruences and how these topics are applied in different fields of study.

The following are the topics covered in the sessions:

- Concept of division algorithm and problems on them.
- Diophantine equation and problems on them to understand the concept.
- Fundamental theorem of Arithmetic.
- Linear congruences.
- Chinese remainder theorem.
- Sum and number of divisors.
- The Mobius Inversion formula.
- The Greatest integer function.
- Application to Calendar problems.

Many problems were solved in the class to make the students have a better understanding of the subject. Problem solving test were conducted in the class to know student's interest and understanding of the subject. Number theory has lot of application in various fields like cryptography, computer science and many other fields. At the end of the course students were given test to assess their understanding of the subject and feedback was collected to improvise the teaching methodology and content of the course.

The main conclusion of this course was to make students to understand the development of theory of numbers, their importance and applications to many fields of study. This course was also intended for the students to develop an interest in studying Mathematics.

Outcome:

Through this value added course students understood division algorithm, linear congruences, residue classes and the Chinese remainder theorem. Students used the concept of divisors, greatest integer function to understand the application to calendar.

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Value Added Course on "Number-Theoretic Function" Photos :
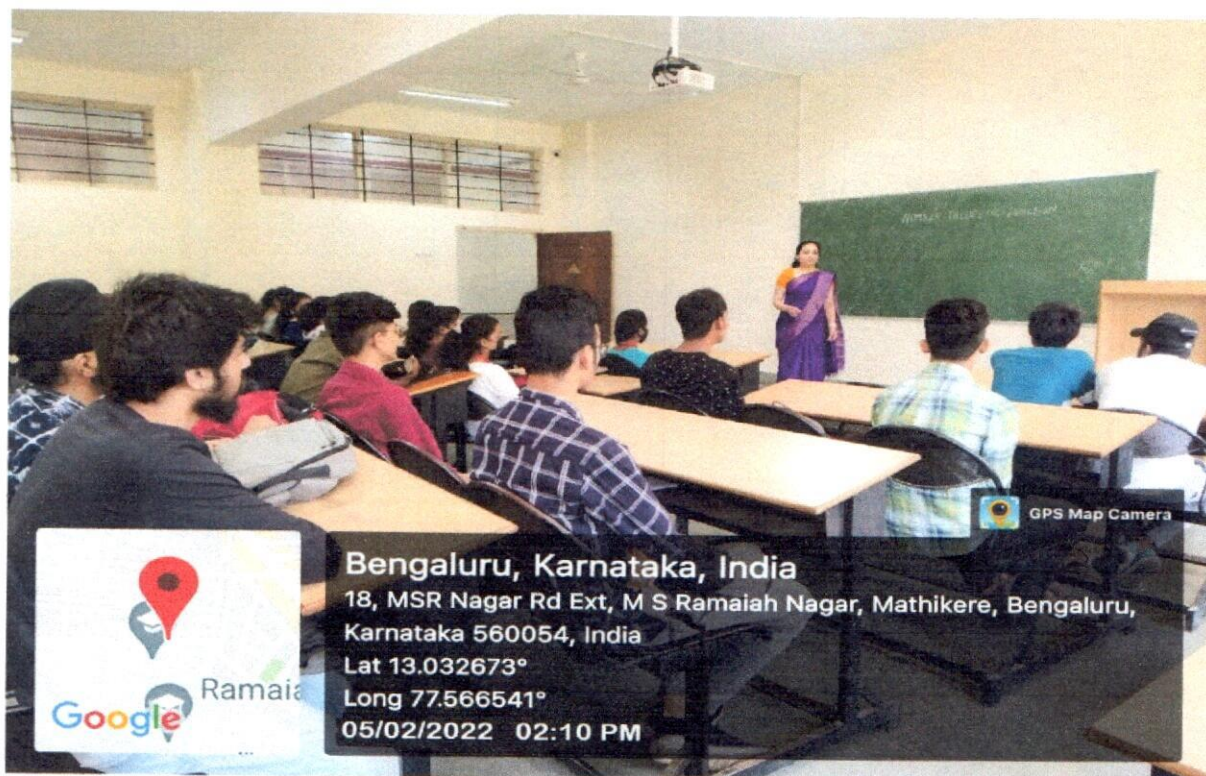
Bengaluru, Karnataka, India
18, MSR Nagar Rd Ext, M S Ramaiah Nagar, Mathikere, Bengaluru,
Karnataka 560054, India
Lat 13.032673°
Long 77.566541°
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2HM8+2HX, 1st Main Rd, M S Ramaiah Nagar, Mathikere,
Bengaluru, Karnataka 560054, India
Lat 13.032611°
Long 77.566506°
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RAMAIAH
College of Arts, Science &
Commerce

ಎಮ್ ಎಸ್ ರಾಮಯ್ಯ ಕಲಾ, ವಿಜ್ಞಾನ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
M S Ramaiah College of Arts, Science and Commerce
Re-accredited 'A' by NAAC, Permanently Affiliated to Bengaluru City University,
Approved by Government of Karnataka, Approved by AICTE, New Delhi,
Recognized by UGC under 2f & 12B of UGC act 1956
(National Institutional Ranking Framework, Ministry of Education, Govt of India)
Ranked 62ⁿᵈ in NIRF India Ranking by MHRD, New Delhi
DBT Star College Scheme

DEPARTMENT: MATHEMATICS

Name of the Programme: Number - Theoretic function

Year :- 2021-2022

Assessment Procedure for Value Added Program:

Department of Mathematics organized value added course on "Number - Theoretic function" from 5th February to 7th April 2022 for the students of 1st year B.Sc.(EMCs) students by the resource person Mrs.Thulasi Rajeev Mudakavi, 22 students participated in this course and the course duration was 30 hours. During the training period, the students gained knowledge of number theory. Theoretic functions are used to mathematically formulate and provide the solutions involving functions of several variables. The students actively participated in the training and also solved the problems given during the session on all the days of the training program. Also viva and MCQ test was conducted for the students by the resource person. Hence the students were given the participation certificate at the end of the program.

The following detail gives the marks of individual students.

Sl No	Student Name	Register Number	Attendance (10)	Quiz (MCQ)(20)	VIVA (10)	Total (40)
1	APOORVA N	U18EV21S0123	10	20	10	40
2	AZEEM RAHIMAN	U18EV21S0170	10	19	10	39
3	ENUGULA SURIYA	U18EV21S0164	10	19	10	39
4	HARSHITHA S	U18EV21S0172	10	20	10	40
5	K BALAJI	U18EV21S0125	10	18	9	37
6	LAKSHMI KALA	U18EV21S0211	8	20	10	38
7	LOHITH R S	U18EV21S0217	8	19	9	36
8	MADHU S	U18EV21S0234	9	19	10	38
9	MOHIT SAIN	U18EV21S0226	8	20	10	38
10	NISHA K	U18EV21S0107	10	20	10	40
11	PRADEEP S	U18EV21S0116	8	19	10	37

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12	RITHU Y J	U18EV21S0209	9	20	10	39
13	SATHISH M	U18EV21S0147	8	20	10	38
14	SHARANU SHIVARAJ NEELA	U18EV21S0165	10	20	10	40
15	LAKSHMI PASWAN V	U18EV21S0117	9	19	10	38
16	SUPRIYA G	U18EV21S0120	10	19	9	38
17	PARIKSHITH N Y	U18EV21S0129	8	20	10	38
18	AMRITHA S	U18EV21S0155	10	20	10	40
19	ANANYA VALLABHA B G	U18EV21S0208	8	20	10	38
20	KAVERI SAHANI	U18EV21S0127	19	20	10	39
21	SAHANA B M	U18EV21S0110	10	19	10	39
22	SUVEETHA S B	U18EV21S0112	10	20	10	40

Outcome: Through this value added course students understood division algorithm, linear congruences, residue classes and the Chinese remainder theorem. Students used the concept of divisors, greatest integer function to understand the application to calendar.

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DEPARTMENT: MATHEMATICS

Name of the Programme: Number-Theoretic Functions

Year : 2021-2022

Assessment Procedure for Value Added Program: MCQ'S.

1. If the HCF if 65 and 117 is expressible in the form 65m – 117, then the value of m is
   a) 4   c) 1
   b) 2   d) 3

2. The inverse of 3 modulo 7 is?
   a) -1   c) -3
   b) -2   d) -4

3. The linear combination of gcd(117,213)=3 can be written as _____
   a) 11*213 + (-20)*117
   b) 10*213 + (-20)*117
   c) 11*117 + (-20)*213
   d) 20*213 + (-25)*117

4. The inverse of 7 modulo 26 is?
   a) 12   **c) 15**
   b) 14   d) 20

5. The inverse of 19 modulo 141 is?
   a) 50   c) 54
   b) 51   **d) 52**

6. The value of 5^{2003} mod 7 is?
   a) 3   c) 8
   b) 4   d) 9

7. The number of element in a set S is denoted by
   a) #S   c) *S
   b) S#   d) S*

8. Q is the set of rational numbers of the form m/n such that

a) **m, n € Z, n≠0**
b) m, n € W, n≠0
c) m, n € Z, n=0
d) m, n € N, n≠0

9. **Both addition and multiplication in Z are_____**
a) Commutative
b) Associative
c) Distributive
d) **All of these**

10. **If *a = qb*for some integers q and a, b ≠ 0 then we say that**
a) b divides a
b) b is a factor of a
c) a is a multiple of b
d) **All of these**

11. **Which positive integer less than 21 are relatively prime to 21?**
a) 18   c) 21
b) **19**   d) 24

12. **The greatest common divisor of $3^{15}.5^{17}$ and $2^{12}.3^5$ is _____**
a) 3^0
b) 3^1
c) 3^3
d) **3^5**

13. **The greatest common divisor of 0 and 5 is _____**
a) 0   c) 2
b) 1   **d) 5**

14. **The least common multiple of 41.42 and 42.41 is_____**
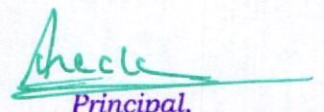a) 42
b) 41
c) 84
d) **41.42**

15. **Which of the following statements are true?**
a) A number is rational if and only if the square is rational
b) **An integer n is odd if and only if n^2 + 2n is odd.**
c) A number n is irrational if and only if its square is irrational.
d) At least one of two numbers *x* and *y* is irrational if and only if the product *xy* is irrational.

16. If both 11^2 and 3^3 are factors of the number a * 4^3 * 6^2 * 13^{11}, what is the smallest possible value of 'a'?
   a) 121   c) 3267
   b) **363**   d) 37

17. Which of the following is a Fibonacci sequence?
   a) 1,1,2,3,4, …
   b) 1,2,3,5, …
   c) 1,2,3,3,8, …
   d) **1,1,2,3,5,8, …**

18. Two consecutive terms of a Fibonacci sequence are
   a) **Coprime**   c) Inverse
   b) Composite   d) None of these

19. An efficient way of obtaining gcd is known as_____.
   a) Well ordering principle
   b) Division Algorithm
   c) **Euclid's Algorithm**
   d) None of the above

20. A positive integer >1 that is not a prime is a _____ number
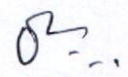   a) Even
   b) Odd
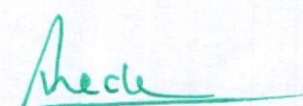   c) **Composite**
   d) Prime

21. Two positive integers a and b are relatively prime if their gcd is _____
   a) 0   c) 2
   b) **1**   d) 3

22. The number of primes ≤ 100 is _____
   a) 24
   b) **25**
   c) 26
   d) 27

RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE

DEPARTMENT OF MATHEMATICS

Value Added Course on Number - Theoretic function

Attendance

5th February to 7th April 2022 (30 Hrs)

Sl.NO	Register No.	Name	05/02	08/02	10/02	11/02	14/02	15/02	17/02	18/02	21/02	25/02	28/02	03/03	04/03	07/03	07/03
1	U18EV21S0123	APOORVA N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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14	U18EV21S0165	SHARANU SHIVARAJ N	1	2	3	4	5	6	6	7	8	9	10	11	11	12	13
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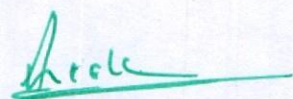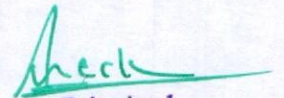
RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE

DEPARTMENT OF MATHEMATICS

Value Added Course on Number - Theoretic function

Attendance

5th February to 7th April 2022 (30 Hrs)

Sl.NO	Register No.	Name	08/03	08/03	10/03	10/03	11/03	14/03	15/03	21/03	22/03	22/03	25/03	25/03	04/04	05/04	07/04
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Bangalore - 560 054

CERTIFICATE OF PARTICIPATION

This is to certify that **APOORVA .N** of I Sem B.Sc(EMCs) has actively participated in Value Added Course on "**Number-Theoretic Function**" organized by Department of Mathematics from 5th Feb 2022 to 7th April 2022.

MR.K.RAVINDRANATH
HOD, Dept of
Mathematics

MRS.HARITHA.A
Co-ordinator

DR.A.NAGARATHNA
Principal, RCASC

Principal,
M.S. Ramaiah College of Arts, Science & Commerce
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This is to certify that **AZEEM RAHIMAN** of I Sem B.Sc(EMCs)

has actively participated in Value Added Course on **"Number-Theoretic**

Function" organized by Department of Mathematics from 5th Feb 2022 to

7th April 2022.

MR.K.RAVINDRANATH
HOD, Dept of
Mathematics

MRS.HARITHA.A
Co-ordinator

DR.A.NAGARATHNA
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Principal,
M.S. Ramaiah College of Arts, Science & Commerce
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CERTIFICATE OF PARTICIPATION

This is to certify that **ENUGALA SUPRIYA** of I Sem B.Sc(EMCs) has actively participated in Value Added Course on **"Number-Theoretic Function"** organized by Department of Mathematics from 5th Feb 2022 to 7th April 2022.

MR.K.RAVINDRANATH
HOD, Dept of
Mathematics

MRS.HARITHA.A
Co-ordinator

DR.A.NAGARATHNA
Principal, RCASC

Principal,
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CERTIFICATE OF PARTICIPATION

This is to certify that **HARSHITHA .S** of I Sem B.Sc(EMCs) has actively participated in Value Added Course on **"Number-Theoretic Function"** organized by Department of Mathematics from 5th Feb 2022 to 7th April 2022.

MR.K.RAVINDRANATH
HOD, Dept of
Mathematics

MRS.HARITHA.A
Co-ordinator

DR.A.NAGARATHNA
Principal, RCASC

Principal,
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CERTIFICATE OF PARTICIPATION

This is to certify that **K.BALAJI** of I Sem B.Sc(EMCs)

has actively participated in Value Added Course on **"Number-Theoretic**

Function" organized by Department of Mathematics from 5th Feb 2022 to

7th April 2022.

MR.K.RAVINDRANATH
HOD, Dept of
Mathematics

MRS.HARITHA.A
Co-ordinator

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