



ATMA RAM SANATAN DHARMA COLLEGE

(UNIVERSITY OF DELHI)

TANGENTIA 2022 - LECTURE ON SOME APPLICATIONS OF “SOME APPLICATIONS OF PERRON FROBENIOUS THEOREM”

Date of Program: 19th February, 2022

No. of Participants: 73

Organized by: Quaternion - Mathematics Society

Speaker: Dr. Ranjana Jain, Assistant Professor, Department of Mathematics, University of Delhi University

Financial Support from ARSD (amount & head): Honararium - 2,000

The day was started by encouraging words by our Principal Sir, Prof. Gyantosh Kumar Jha who is always a source of inspiration for us, followed by a welcome Note by Dr. Preeti Jain. The highlight of the event was an inaugural lecture by our Guest Speaker for the day Dr. Ranjana Jain from the Department of mathematics, University of Delhi. She delivered a talk on ‘Some Applications of Perron Frobenius theorem’. The aim of this talk is to discuss the celebrated Perron Frobenius theorem from the theory of matrix analysis. It mainly describes some elegant characteristics of the eigenvalues and the eigenvectors of a square matrix with positive entries. Dr. Jain elaborated some of its applications to diverse areas such as Markhov Chains, web search engines, population growth models and wireless networking. She further added to it that our ‘Google’ on which the majority of us are dependent today or in other words we rely on it for any sort of details we require is an excellent example based on application of the above theorem.



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PHOTOGRAPH

Recording... You are viewing Ranjana Jain's screen View Options

For a nonnegative matrix $A \in M_n$,

- A is irreducible iff $(I + A)^{n-1} > 0$.
- A is irreducible iff for every pair of indices i and j , $\exists m \in \mathbb{N}$ such that $(A^m)_{ij} > 0$.
- A is primitive iff A is irreducible and has only one non-zero eigenvalue of maximum modulus.
- A is primitive iff $A^{n^2-2n+2} > 0$.

For $A \in M_n$, the spectral radius of A is given by

$$\rho(A) = \max\{|\lambda| : \lambda \text{ is an eigenvalue of } A\}$$

In general, spectral radius need not be an eigenvalue of a square matrix.

Ranjana Jain SOME APPLICATIONS OF PERRON-FROBENIUS THEOREM

Unmute Start Video Security Participants 56 Chat Share Screen Pause/Stop Recording Breakout Rooms Reactions Leave

Ranjana Jain
Priya Sangwan
Priya Sangwan
Dr. Preeti Jain
ANIL KUMAR R...
ANIL KUMAR RAJAK
Raj Kumar Bhagat
Raj Kumar Bhagat
CHHATRA PAL
CHHATRA PAL

Presentation by Dr. Ranjana Jain

Zoom Meeting Recording...

Chat

Can write questions in the chat box.

Dr. Preeti Jain to Everyone
please type your queries

ANIL KUMAR RAJAK to Everyone
Dear Participants if you have any questions kindly write your questions in the chat box.

Anandita to Everyone
Good morning ma'am, can Perron theorem be applied on arbitrary term matrices as well (ie neither all positive nor all negative)?
okayy, thankyou!

Who can see your messages? Recording On

To: Everyone Type message here...

ENG IN 11:23 19-02-2022

Ranjana Jain
Priya Sangwan
Dr. Preeti Jain
ANIL KUMAR RAJAK
Shilpi Jain
Raj Kumar Bhagat
Mamta Saini
Amit Mittal
Amit Kumar
Jyoti Kaushik
Rajpal Rajbhar
Jeevika Sharma
Bhoovi
Pragya Sharma
Ipsita Behera
Harsh
Tanisha Prasad
Shivani Bisht
Mohit
ARPIT RATHORE
Anandita
Monica Suri
Pooja Goyal
RAHUL RATHOR
Ankush

Participants during the Webinars



ATMA RAM SANATAN DHARMA COLLEGE

(UNIVERSITY OF DELHI)

POSTER



Atma Ram Sanatan Dharma College

(University Of Delhi)

Accredited Grade 'A' by NAAC/ Rank 12 by NIRF



QUATERNION

THE MATHEMATICS SOCIETY

Presents

TANGENTIA'22

19th and 20th February



**SOME APPLICATIONS OF
PERRON FROBENIOUS
THEOREM**



Dr. Ranjana Jain

Scheduled on :



February 19, 2022

10 AM



Zoom

Pooja Goyal
(President)
Priya Sangwan
(Vice-president)

Patron
Prof. Gyantosh Kumar Jha
Principal

Conveners
Dr. Preeti Jain
Mr. Anil Kumar Rajak



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(UNIVERSITY OF DELHI)

LIST OF THE STUDENTS

| S.No. | Student Name | College |
|-------|-----------------------|--------------|
| 1 | Anushri Gupta | ARSD COLLEGE |
| 2 | Shivani Sagar | ARSD COLLEGE |
| 3 | Sneha | ARSD COLLEGE |
| 4 | PRIYA | ARSD COLLEGE |
| 5 | Divansh Pandit | ARSD COLLEGE |
| 6 | Shresth Shukla | ARSD COLLEGE |
| 7 | Tanya Mittal | ARSD COLLEGE |
| 8 | Deepa chaudhary | ARSD COLLEGE |
| 9 | Titiksha Anand | ARSD COLLEGE |
| 10 | Nidhi Raj | ARSD COLLEGE |
| 11 | AAKASH | ARSD COLLEGE |
| 12 | Pratham dangi | ARSD COLLEGE |
| 13 | NAVJEET SINGH | ARSD COLLEGE |
| 14 | Hariom Patidar | ARSD COLLEGE |
| 15 | Digvijay Choudhary | ARSD COLLEGE |
| 16 | Rahul Kumar | ARSD COLLEGE |
| 17 | Rahul | ARSD COLLEGE |
| 18 | NIKKI | ARSD COLLEGE |
| 19 | BEERU | ARSD COLLEGE |
| 20 | Nitin soni | ARSD COLLEGE |
| 21 | ARJUN K NANDAN | ARSD COLLEGE |
| 22 | Pratiksha Singh | ARSD COLLEGE |
| 23 | Abhishek Pandey | ARSD COLLEGE |
| 24 | Raj Singh | ARSD COLLEGE |
| 25 | AMAN SINGH CHAUHAN | ARSD COLLEGE |
| 26 | Arpit Rathore | ARSD COLLEGE |
| 27 | ANKIT KUMAR | ARSD COLLEGE |
| 28 | RITIK | ARSD COLLEGE |
| 29 | TARUN KUMAR NAIDU | ARSD COLLEGE |
| 30 | SONU KUMAR | ARSD COLLEGE |
| 31 | HARSHITA | ARSD COLLEGE |
| 32 | MRIDUL SAINI | ARSD COLLEGE |
| 33 | SAURAV KUMAR | ARSD COLLEGE |
| 34 | ROHIT SINGH RAUTELA | ARSD COLLEGE |
| 35 | UTKARSH SINGH CHANDEL | ARSD COLLEGE |
| 36 | VAIBHAV JOSHI | ARSD COLLEGE |
| 37 | PARAMJEET | ARSD COLLEGE |
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| 50 | SHANU MISHRA | ARSD COLLEGE |
| 51 | Annanya Gogia | ARSD COLLEGE |
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| 73 | Srishti Rawat | ARSD COLLEGE |