CMS

CALCUTTA MATHEMATICAL SOCIETY

VOLUME 46 NUMBER 6-12 JULY , AUGUST, SEPTEMBER,OCTOBER , NOVEMBER , DECEMBER 2023

NEWS BULLETIN *of* CALCUTTA MATHEMATICAL SOCIETY

NEWS BULLETIN OF CALCUTTA MATHEMATICAL SOCIETY

Aim and Scope : News Bulletin of Calcutta Mathematical Society is a journal intended for the publication of semi-popular, pedagogic and review articles on mathematics and application of mathematics in science and technology in addition to information about CMS and its activities. Articles on the mathematical modeling of any socio-economic problem of national importance will be encouraged. Articles are supposed to be written in an informal style to appeal a wide range of readers. Mathematical expression or symbols should be as simple as possible. News Bulletin is also intended to publish book-review, national and international news on mathematics and mathematical sciences, information and discussions regarding the teaching of mathematics in India and abroad, information regarding national and state policies relevant to the study and research in mathematical sciences, announcement and advertisements regarding the activity on mathematical sciences, and finally the academic and research activities of the Calcutta Mathematical Society or any other similar societies or organizations.

Instructions to Authors : Manuscripts should be double spaced with ample margins. References to literature in the text should be in the parenthesis. References cited in the text should be listed at the end of the articles in the alphabetical order of surnames. Printing cost of articles at the rate of Rs. 200 per page for members (India) and the $ 20.00 for others (Foreign) shall be paid by the authors/or their institutions. Authors receive only soft copies by mail. Two copies of the manuscript of any news should be sent to Secretary/Editorial Secretary, Calcutta Mathematical Society, AE 374, Sector I, Salt Lake City, Kolkata 700064 (India)

NEWS BULLETIN OF CALCUTTA MATHEMATICAL SOCIETY

VOLUME 46 NUMBER 6-12 JULY , AUGUST, SEPTEMBER,OCTOBER , NOVEMBER , DECEMBER 2023

C O N T E N T S

CURRENT NEWS

- 17th International Conference of IMBIC on " Mathematical Science and Technology"(MSAST 2023 , Dec 21-23 , 2023) Kolkata , India.

N O T I C E

It is for information to all members of the Calcutta Mathematical Society, that the monthly Ordinary General Meetings of the Mathematical Society for the month of July, August, September , October, November, December 2023 held at 4:00 p.m. on 15th July,12th August, 16th September,18th November, 23rd December respectively at the premises of the Society, AE - 374, Sector-I, Salt Lake, City, Kolkata - 700064.

Dated18.04.2024

(Dr. Arindam Bhattacharyya)

Secretary.
Calcutta Mathematical Society

N O T I C E

Admission Notice for 46th Net Training Programme in Mathematics,four months NET Training preparatory Courses will started 5th August 2023 .

Dated14.04.2024

(Dr. Arindam Bhattacharyya)

Secretary.
Calcutta Mathematical Society

ANNUAL REPORT OF THE CALCUTTA MATHEMATICAL SOCIETY
FOR THE PERIOD FROM 1st APRIL 2022 TO 31st MARCH 2023

INTRODUCTION

Founded : September 6, 1908 at the Senate House of the University of Calcutta.

Founder President : Sir Asutosh Mookerjee.

Type of the Society : Registered Society (Reg. no.6832/85) with an objective for promotion of education and research in Mathematics and Mathematical Sciences.

Postal Address : AE-374, Sector-I, Salt Lake City, Kolkata-700064.

Status : Internationally recognized academic Society.

Telephone : +91 98753 40610, 03340647875

Email : cms.office2010@gmail.com

Website : **www.calmathsociety.co.in**

Administrative Complex : "ASUTOSH BHAVAN"
AE-374, Sector-I,
Salt Lake City,
Kolkata-700064.

Academic Complex : "ASUTOSH BHAVAN"
AE-374, Sector-I,
Salt Lake City,
Kolkata-700064.

ANNUAL REPORT

The annual report of the Calcutta Mathematical Society is a record of its broad academic and administrative programs and performances during the period from 1st April , 2022 to 31st March 2023. This annual report also reflects the progress achieved by the Society during this period

The Council Members (2022-2023)

President : Dr. Rasajit Kumar Bera

Vice-Presidents : Dr. Debidas Chattoraj, Dr. T.Som , Dr. Joydeb Chattopadhay, Dr. Kajal De, Dr. Sanjib Kumar Datta.

Secretary : Dr. Arindam Bhattacharyya

Treasurer : Dr. Koushik Ghosh

Editorial Secretary : Dr. Indrajit Lahiri

Assistant Secretary : Dr. Partha Karmakar

Other Members of Council : Dr. Rajat Kumar Banerjee , Dr. Malay Banerjee , Dr. Krishnapada Das , Dr. Dilip Kumar Ganguly, Dr. Kalyan Halder , Dr. Bablu Biswas, Dr. Nurul Islam , Dr. Aloke Pal , Dr. Rajkumar Roychoudhury , Dr. Seema Sarkar , Dr.Gopal Chanda Shit , Dr. Gokul Saha , Dr. Kalishankar Tewari.

ACTIVITIES OF THE CALCUTTA MATHEMATICAL SOCIETY (2022 - 2023)

Administrative and academic activities of the Calcutta Mathematical Society during the period from 1st April 2022 to 31st March 2023 are presented in brief....

1. Administrative activities:

There are i) Ten (10) Council Meetings and ii) Seven (7) Ordinary General Meetings and one Annual General Meeting were held during this period.

2. Advanced Mathematical Ability Test for Class IX& X:

Calcutta Mathematical Society conducted an Advanced Mathematical Ability Test for the students of class IX and X to celebrate its115-th Foundation Day on 6-th September. The test will be held online on 6th September, 2022 between 2:00 p.m – 3:00 p.m. All the participating students received E- certificate for participation after duly submission of feedback form. Students from Kolkata and other districts of West Bengal participated in the Test. Shortlisted candidates called for interview and best students were rewarded.

3. NET Training Program for the postgraduate students in Mathematics:

It is observed that to improve the level of Ph.D aspirants, an academic preparation of the students for Ph.D. program in Mathematics in various Universities and Institutes in the country is needed. Calcutta Mathematical Society had started a training program for the postgraduate students in Mathematics to facilitate preparation for NET/SET by renowned resource persons from the different Universities /Institutes. Four months training program is conducted by the Society two times per year. Total fifteen (15) students were trained during this period.

SEMINER

- **Prof. M.R. Gupta Memorial Seminar on Nonlinear and Complex Phenomena** Calcutta Mathematical Society (CMS)organized a seminar in collaboration with Centre for Plasma Studies(CPS) , Jadavpur University (JU) , Kolkata &Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Kolkata was held in 4th August 22 the premises of the Calcutta Mathematical Society. The mode of the conference over offline mode.
- **Foundation Day Celebration**

  Calcutta Mathematical Society, Kolkata, India organized a Webinar on History of Science on 06 September, 2022 to celebrate its 115th birthday. The speaker is Prof. Ashish Kumar Lahiri, Adjunct Professor, Indian Institute of Science Education and Research, Kolkata, India. Time: 11:30 AM - 01: 00 PM (Indian Standard Time).

- **International Conference on Algebra ,Mathematical Analysis & Simulation (ICAMAS-2022)**

  The International Conference on Algebra, Mathematical Analysis & Simulation(ICAMAS-2022) organized during December 8 to 10 at the premises of the Calcutta Mathematical Society. The mode of the conference over offline and online (hybrid)mode. Students, Faculty members and Research Scholar from various disciplines of Mathematical Science are able to join the seminar.

  Hard Copy of Certificate will be provided to offline participants and Soft copy of certificate will be provided to the online participant.

Brief Report on "International Conference on Algebra , Mathematical Analysis & Simulation (ICAMAS-2022):

Calcutta Mathematical Society (CMS) organized three days International Conference on Algebra, Mathematical Analysis & Simulation (ICAMAS-2022) during 8th-10th December, 2022 . Distinguished eminent speakers delivered their lectures on different aspects of solving a Class of Non-Standard Real Estate Options , eigen polygon , solitary solutions, curvature inheriting symmetry on Finsler Space , Banach Contraction , fixed point theorem, higher non linear Boolean functions etc.On the first day of the program i.e., on 8th December, 2022 the conference started with the inaugural program. In the beginning of the program, Prof. Arindam Bhattacharyya, Secretary, CMS welcome the eminent speakers, respected dignitaries, all the Vice Presidents, Editorial Secretary, Assistant Secretary, Treasurer, council members, ordinary members and office staffs of Calcutta Mathematical Society and participants from and outside the country. Nextly, Prof. Sanjib Kumar Datta, Joint Convener, ICAMAS-2022 &Vice-President, CMS gave the outline of theprogram highlighting the main theme of theconference. The presidential address was delivered by Prof. Rasajit Kumar Bera, President, CMS. Dr. Koushik Ghosh, Coordinator, ICAMAS 2022 & Treasurer, CMS delivered the vote of thanks. during 11.10-11.15 a.m.

At the end of the inaugural program of the conference a photo session was shoot covering the participants and dignitaries.

On the first day of the program i.e., on 8th December, 2022, Prof. Kailash Patidar, Professor, University of the Western Cape, South Africa talked on the Non-Standard Finite Difference Method to Solve a Class of Non-Standard Real Estate Options during 11.30 a.m.-12.00 Noon Offline). The session was chaired by Prof. Rasajit Kumar Bera, President, Calcutta Mathematical Society (CMS).

On the same day, at 12.00 Noon -12.30 p.m. (Online), due to some technical difficulties Prof. Ameeya Kumar Nayak, IIT Roorkee could not be able to deliver his lecture .The session was scheduled to be chaired byProf. (Dr.) Subir Das, IIT, BHU. During 12.30 – 1.00 p.m. (Offline), Dr. Md. NurAlam, Pabna University of Science and Technology, Bangladesh spoke on an Eigen polygon and its application to the non-uniform approximating subdivision surface under the chairmanship of Prof. (Dr.) Sushanta Kumar Mohanta, West Bengal State University.

In the Pre-Lunch session i.e. at 1.00 -1.30 p.m. (Offline),Dr. Rajat Banerjee, Council Member, CMS was the chairperson and Prof. Harun-Or-Roshid, Pabna University of Science and Technology, Bangladesh was the speaker. Hedelivered the lecture on Solitary solutions and chaotic behaviors to the Telecommunication modelusing bifurcation analysis. Prof. Chayan Kumar Mishra, Dr. Rammanohar Lohia Avadh University, U.P. could not be able to deliver his lecture during 2.30–3.00 p.m.(Online) due to some technical difficulties. The session was scheduled to be chaired by Prof.Malay Banerjee, Council Member, CMS. In the session (3.00-3.30 p.m., offline), Prof. (Dr.) Sushanta Kumar Mohanta, West Bengal State University delivered the lecture on the Generalization of Banach Contraction Theorem in Different Spaces under the chairmanship of Prof. (Dr.) Subir Das, IIT, BHU.

In the parallel Session 1A & 1B during 3.45-5.30 p.m. 7 papers have been presented under the chairmanship of Dr. Bablu Biswas, Co-ordinator, ICAMAS-2022 , Council Member, CMS and Dr. Koushik Ghosh, Coordinator, ICAMAS-2022 & Treasurer, CMS respectively in each sessions.

On the second day of the program i.e., on 9th December, 2022, Prof. Ismat Beg, Professor, Lahore School of Economics, Lahore, Pakistan talked (Cullis Memorial Lecture) on the Fixed Point Theory of Multivalued Mappings during 10.00-10.45 a.m. (Online). The main theme was three fundamental fixed point theorems, some recent developments in fixed points of multivalued mappings and Open problems for future work. The session was chaired by Prof. B. S. Chowdhury, IIEST, Shibpur. This session was dedicated for 100-year completion of “Banach Contraction Principle”.In the Session(10.45-11.30 a.m.), under the chairmanship of Dr. Krishnapada Das, Council Member, CMS papers have been presented. On the same day, at 11.30 a.m. -12.15 p.m. (Online), Prof. Sugata Gangopadhyay, IIT Roorkee delivered a speech(Saha & Saha Memorial Lecture) on Construction of Higher Non-linear Boolean Functions . The main theme was the idea of nonlinearity of Boolean functions, bent functions, two primary classes of bent function namely, the Maiorana-McFarland class and the Partial Spreads class and the notion of Z-bent functions as an effort to put the bent functions in a recursive framework. The session was chaired by Dr. Hemangi Shah, Harish-Chandra Research Institute, Allahabad.

During 12.15-1.00 p.m.(Offline), under the chairmanship of Prof. D. K. Ganguly, Ex-Vice President & Council Members, CMS, Dr. Hemangi Shah, Harish-Chandra Research Institute,

Allahabad gave a lecture (Suddhodan Ghosh Memorial Lecture) on the generalization of the Hopf Conjecture.
Further, Prof. Manoranjan Mishra, IIT Ropar delivered an illuminating talk (S.N. Bose Memorial Lecture) on the Reaction Induced Kelvin-Helmholtz Instabilityat 1.00-1.45 p.m.(Online). The main focus was on the occurrence of chemo-hydrodynamic instabilities such as fingering instability, Rayleigh-Taylor and the Kelvin-Helmholtz (K-H) instability as a hydrodynamic instability. The session was chaired by Prof. Rajkumar Roychoudhury, Ex-President & Council Member , CMS.

After Lunch Break, during 2.30-3.00 p.m. (Offline), Dr. Anuj Bhowmik, ISI, Kolkata spoke on Mathematics in The Disguise of Economics under the chairmanship of Prof. Kajal De, Vice President, CMS.

Nextly, Prof. Andrew Rees, University of Bath, UK gave a lecture (N. R. Sen Memorial Lecture) on the Sutton problem : the transition from Darcy-Benard to Wooding at 3.00-3.45 p.m. (Online). The main theme was the Sutton problem consists of a uniform porous layer which is heated from below but where aconstant, uniform vertical through flow passes through the porous bounding surfaces, when Pe is large, all the convective dynamics took place within a thermal boundary near the hot surface; this is the Wooding problem which is well-known to be subject to subcritical instabilities and a nonlinear stability curve to complement the linear stability curve .The session was chaired by Prof. Debidas Chattoraj, Vice President, Calcutta Mathematical Society.

In the parallel Session 2A & 2B (3.45-5.30 p.m.) 7 papers in each Session have been presented. Dr. Prabir Gharami was the chairman in the parallel Session 2A & Dr. Gokul Ch. Saha, Council Member, CMS was the chairman in the parallel session 2B.
On the last day i.e. 10th December, 2022, Prof. Malay Banerjee, Council member of CMS was the chairman and Prof. Binod Chandra Tripathy, was the speaker. He spoke on n-Normed Sequence Spaces during 10.00-10.30 a.m. (Online). The main theme was about n-Normed Sequence Spaces.

Further, Dr. Anirban Banerjee, IISER Kolkata delivered a lecture on spectral study of hypergraphs using matrices at 10.30-11.00 a.m. (Online). The main theme was a hypergraph by different connectivity matrices, such as adjacency matrix, Laplacian matrix, normalized Laplacian matrix, eigenvalues of these matrices reveal different features of hypergraph, various structural characteristics of the hypergraph, like diameter, vertex strong-chromatic number, Cheeger constant, etc., the spectral properties of these matrices and random walk and (Ricci) curvature on the hypergraph using a matrix representation of that hypergraph. The session was chaired by, Prof. Arindam Bhattacharya, Secretary, CMS.

In the parallel Session 3A & 3B i.e. during 11.00-1.30 p.m.8 papers have been presented under the chairmanship of Dr. Md. Zulfikar Ali, Professor, Rajshahi University, Bangladesh and Prof. Kailash Patidar respectively in each Session. After launch break i.e. at 2.30-3.30 p.m. in the Session 4, 6 papers have been presented and Dr. Kalyan Halder Council Member, CMS was the chairman.

The Valedictory Session was started on 10th December, 2022. Prof. Gopal Chandra Shit, Joint Convener, ICAMAS-2022 & Council Member, CMS highlighted the summary of the

Conference. Dr. Koushik Ghosh ,Coordinator, ICAMAS-2022 & Treasurer, CMS took the feedback from the participants. Prof. Arindam Bhattacharyya , Secretary, CMS took the suggestions from the Council Members of CMS. The prize distribution session was conducted by Dr. Koushik Ghosh , Co-ordinator, ICAMAS-2022. At the fag end of the session, Prof. Sanjib Kumar Datta, Joint Convener, ICAMAS-2022 &Vice-President, CMS delivered the vote of thanks . In his talk Prof. Datta highlighted that during the moment all dignitaries become enriched with illuminating lectures and far-reaching talks delivered by distinguished and renowned speakers on their chosen research fields. In a word, the International Conference on Algebra, Mathematical Analysis & Simulation (ICAMAS-2022) has been organized during the last three days has given a new dimension to the existing knowledge of the stake holders. Also, the organizing committee deeply acknowledges the technical and other support like refreshment by the supporting staff of Calcutta Mathematical Society. Once again, Prof. Datta took the opportunity to express his heartfelt respect to all the stake holders and shared his good feelings with all of his learned friends on this Blended (Offline and Online both) platform.

AWARDS

I. Rs. 3000/- were given to Nilarka Pahari, the 1st. rank holder and also to Arindrajit Das, the 2nd. rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022 from the Society's own fund.

II. "Professor Sanjay Sen Memorial Award", of Rs.3000/- ,donated by Prof. Rajkumar Roychoudhury, Ex-President, Calcutta Mathematical Society was given to Rayan Das, a rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022 .

III. "Anita Bose Majumdar Award" of Rs. 2000/-, was given to Diya Ghosh, another rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022.

IV. A "Special Award" of Rs. 1000 provided by Prof. Rajkumar Roychoudhury, Ex-President, Calcutta Mathematical Society was given to Kirutika Gopikrishnan and Aaditya.V another rank holders of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022.

PUBLICATION

Publication of Journals :

The Calcutta Mathematical Society published all of its three internationally recognized series of journals namely, 1) Bulletin of the Calcutta Mathematical Society, 2) Journal of the Calcutta Mathematical Society , and 3) News Bulletin of Calcutta Mathematical Society in time.

1)Bulletin of the Calcutta Mathematical Society : During the period a total number of 118 research papers were received, 34 papers were accepted, 50 papers are under review, 08 papers

are under revision and 20 papers were rejected. The number of published papers is 71. The rejection rate is about 16 %. Volume 114, No. 3-6 (2022) and Volume 115, No. 1 & 2 (2023) of the Bulletin of the Calcutta Mathematical Society were published during this period.

2) Journal of the Calcutta Mathematical Society : During the period the total number of research papers were received 96, 16 papers were accepted, 58 papers are under review and 08 papers are under revision and 17 papers were rejected. The number of published papers is 19. The rejection rate is about 18 % . Volume 18, No. 1 & 2(2022) of the Journal of the Calcutta Mathematical Society were published during this period.

3) News Bulletin of Calcutta Mathematical Society : During the period the total number of 05 papers were received, of which 02 were published and 03 were rejected. Volume 45, No .4-12(2022) and Volume 46, No. 1-3(2023) of the News Bulletin of Calcutta Mathematical Society were published during this period.

LIBRARY OF THE CALCUTTA MATHEMATICAL SOCIETY

Over the years, the library of the Society has attained the distinction of being one of the richest libraries in the country particularly in the field of Mathematics. Library has now 18933 volumes of books and journals altogether. The Society has exchange relation with different Universities, Institutions and learned Societies all over the world under "Journal exchange program". Society now receives 64 foreign journals from USA, UK, Japan, Korea, Yugoslavia, France, Australia, Germany, Spain, Czech Republic, Italy, Poland, Canada, Turkey, Bulgaria, China, Hungary, Malaysia, Finland, Egypt, Denmark and12 journals from different states of India. Library also maintains manuscripts and letters of Professor S. N. Bose, Life History of Professor Bibhuti Bhusan Dutta (Later known Swami Vidyaranya). Several valuable papers of the eminent scientists like Meghnad Saha, C. V. Raman, K. Chandrasekhar, S. N. Bose, Ganesh Prasad and many others had been published in the Bulletin of the Calcutta Mathematical Society, which were kept in the library as hard copy and as soft copy too. During the period under report total no. of books were 6853 and total number of bound volumes of journals were 12,188. Library book entry in Excel database was going on during this period.

Due to pandemic situation during this period library services were given to the research scholars, teachers and students of mathematics and mathematical sciences from India and abroad through e-mail. Soft copy of the research papers were sent to them through e-mail.

FUTURE PLANS AND PROGRAMS

- Prof. M.R. Gupta Memorial Seminar on Nonlinear and Complex Phenomena will be jointly organized by Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Kolkata and Calcutta Mathematical Society (CMS), Kolkata in collaboration with the

Centre for Plasma Studies, Jadavpur University, Kolkata to be held on 18th August, 2023 (Friday) in offline mode.

- Calcutta Mathematical Society will conduct Advanced Mathematical Workshop on Mathematical Analysis, Applied Probability and Astrophysics(WMAAPA - 2023) on 8 - 15 September 2023 in online mode.

- Calcutta Mathematical Society will conduct Advanced Mathematical Ability Test 2023 for students of class XI and XII to celebrate its 116-th Foundation Day on 6-th September 2023.

- Calcutta Mathematical Society will conduct an Advanced Mathematical Workshop for school students class VII to X on Geometry & Number system on 30th September 2023.
- Calcutta Mathematical Society will conduct an International seminar in 5 - 7 December 2023.

- An International Seminar will be held in the month of February 2024 in the premises of Calcutta Mathematical Society to celebrate the 131st Birthday of Prof. Satyendranath Bose.

DONATION

1. Society received Rs.5,000/- for society's welfare, from Ajay Chatterjee.

2. Prof. Arindam Bhattacharyya , Secretary of the Society, donated Rs.1000/ - for the development of the Society.

3. Society received Rs. 1000/- for society's welfare, Tapan Maiti.

(Prof. Dr. Arindam Bhattacharyya)
Secretary
Calcutta Mathematical Society

INDEPENDENT AUDITOR'S REPORT

TO MEMBERS OF CALCUTTA MATHEMATICAL SOCIETY

Report on the Audit of the Financial Statement.

Opinion

We have audited the accompanying financial statements of **CALCUTTA MATHEMATICAL SOCIETY** which comprise the Consolidated Balance Sheet as at 31st March 2022, the Statement of Income & Expenditure Account and the Receipts & Payments Account of General Fund and Subsidiary Funds for the year then ended.

In our opinion and to the best of our information and according to the explanations given to us, the accompanying financial statements give a true and fair view of the financial position of the Society asat March 31, 2022, of its financial performance and of the Receipts and Payment for the year then ended in accordance with the Accounting Standards issued by the Institute of Chartered Accountants of India (ICAI).

Basis of opinion

We conducted our audit in accordance with the standards on auditing (SAs) issued by ICAI. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Society in accordance with the Code of Ethics issued by ICAI and we have fulfilled our other ethical responsibilities in accordance with the Code of Ethics. We believe that audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of Matter

Without qualifying our opinion, we draw attention to the following:

1. The financial statements have been prepared on cash basis.
2. Fixed assets are reported on written down value instead of cost of acquisition.
   The above accounting practices are followed consistently since long and we have not qualified our report in this respect.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation of those financial statements in accordance with West Bengal Societies Registration Act, 1961 and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error. In preparing the financial statements, management is responsible for assessing the Society's ability to continue as a

going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Society or to cease operations, or has no realistic alternative but to do so.

Those Charged with governance are responsible for overseeing the Society's financial reporting process.

Auditors Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion, Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by the management, as well as evaluating the overall presentation of the financial statements.

Further to above, were port that:

i) We have obtained all information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit.

ii) In our opinion proper books of account as required by law have been kept by the Society, so far as appears from our examination of those books.

ii) The Balance Sheet, the Income & Expenditure Account and Receipts and Payments Account of the Society dealt with in this report are in agreement with the books of account.

iii) In our opinion and to the best of our information &explanations given to us, the accounts give a true and fair view of the state of affairs of Society as at 31 March 2022, of the excess of income over income expenditure and of the Receipts and Payments for the year ended on that date.

HISTORY OF VEDIC SCIENCE IN THE LIGHT OF MATHEMATICS

Prof.MMajumdar(Retd)
Department of Pure Mathematics
University of Calcutta Kolkata,India

Little is known about the achievement of the ancient Hindu Mathematics. The contribution can be divided into the following categories:

I. Zero and the place-value notation for numbers
II. Vedic mathematics
III. Sulya-sutras
IV. Astronomy
V. Algebra
VI. Trigonometry
VII. Analysis

Indian mathematicians have taken terminology 1014 around 1st Century B.C , whereas Greeks had no terminology above 104 and Romans had not erminology above 103.The number "zero" is the subtle gift of the Indians of antiquity to mankind. But nobody knows the exact time and the name of the inventor for zero. they are found on the Rock Edits of Ashoka (256 BC). Europe came to know through Arab, when Md. Musa of Baghdad explained it around 820 A.D. For this reason, it is called Indo-Arabic Numerals, whereas, the exact time and name of the inventor is not known. Indo-Arabic Numerals European book (in French) first used ”zero” in 1275.
"Patiganita"is the word for Arithmetic. In Buddhist literature, it has been mentioned that there are three classes of Ganita,namely"mudra"(fingerarithmetic),"ganana"(mentalmathematics) and ”Samkhyana” (higher arithmetic). Aryabhata mentioned in his book "Aryabhatiya" written in 499 AD that there are eight fundamental operators namely addition , subtraction , multiplication , division , square , square root ,cube , cube root . The names of great ancient Indian mathematicians whose contribution sareremarkableare: Aryabhata I (b475AD), Bhaskara I (b528AD), Brahmagupta I (b598AD), Aryabhata II (b950AD), Bhaskara II (b1114AD).
From the times of Vedas, their tualliterature , which gave directions for constructing sacrificial fares , deals with their measurements and contructions of different kinds of altars ("Vedi"s). Thus giving rise to ”sulyasutras”. All the seven books are in the name of Rishis and are written between 800 - 500 BC. Three books "Bodhyana", "Apastamba" "Katyayana" are important from the mathematical point of view. "Bodhyana" is the oldest and biggest, oral lectures delivered by the Rishi Bodhyana. This bookhas 3 chapters of 116sutras , 86sutras , 323sutras respectively. The theorem of the Pythagoras theorem in Bodhyana.

Pythagoras is believed to live from about 572 - 501 BC. Sulyas are far prior to him. Surds are called "Karani" by Hindus and the remarkable approximation of the squareroot of two is found in it as1.4142156. Bodhyana also the value of π as 3.088 . Some of the remarkable results without proofs are found in these Sulyas. " Katyana" exhbits the geometrical knowledge of the human body.

Earliest available text on Astronomy , which is called “ Jyotisa” in Sanskrit , is “Aryabhatiya”. This book has 4 parts. The first part, named “Gitakapada”, mentioned that

the diurnal motion of the heavens is due to the rotation of the earth about an areas. The third part named " Kalakriyapada" has calendrical concepts , procedure for calculation of planetary positions, 25 formulas coded in Sanskrit language by applying which one can say about the exact tune while watching the position of stars. The last part named "Golapada"gives problems on Spherical astronomy. A famous astronomer , Varaha Mihira wrote a book ' Panch Siddhartika ' in 505 AD. Correct version of Modern Indian Calender is due to him.

Ancient Indian Mathematics mentioned Mathematicians mentioned 'Bijaganita' as Algebra. The second part , named 'Ganitapada' of ' Aryabhatiya' has problems on squaring , squre root, cube , cube root , areas and volumes of many geometrical figures.

Aryabhata mentioned the value of π as 3.1416. He 1st gave the method of solving quadratic equations, First degree in determinate equations and also the formula for summation n natural numbers , sum of that sums , sum of squares and cubes of first n natural numbers Bhaskara II completed the book "Siddhanta-Siromoni" in 1150 AD. It has 4 parts. The first part, named "Leelavati" deals with arithmetic , algebra , geometry and measeration . It has been translated into Persian by Fyzi, brother of Abul Fazi, by the command of great Mughal emperor Akbar in 1587. The second part , named 'Bijaganita' deals with Advanced Algebra where permutation , combination has been mentioned as "anka pasha". These portion was also translated into Persian in 1634. The last two parts relate to Astronomy where he gave the formule of Sin (A$\pm$B) , Sin 18^0 and many more . Brahmagupta is known as the Indian Mathematician per excellence. His monumental work "Brahma-Sphuta-Siddhanta" (628 AD) was translated by Arab in 770 AD. He was the first , in the world of mathematics , to discuss cycle quadrilaterals. His outstanding contribution was the solving of the indeterminate equation $Nx^2 + 1 = y^2$, N being positive integer. The problem of determining inter solutions and repeated application of such is known as Brahamagupta's Bhavna Principle.

Aryabhata in his book , gave the table of " Sin" for different areas lying between 0^0 and 90^0. He first introduced $r\sin\alpha$, $r\cos\alpha$, where r is the radius of the circle and α is the angle at the center.

Kerala mathematician Madhaba (circa 1340-1425 AD) introduced the Sinc and Cosine series about 300 years before Newton. He may be considered as the founder of Mathematical Analysis.

May we hope that the new millenium shall spread mathematical knowledge conceived by Indian-born mathematicians.

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PROGRAMME HELD DURING JULY 23 TO DEC 23

- **Prof. M.R. Gupta Memorial Seminar on Nonlinear and Complex Phenomena :**

  Calcutta Mathematical Society (CMS)organized by Calcutta Mathematical Society (CMS) in collaboration with Centre for Plasma Studies (CPS), Jadavpur University (JU), Kolkata & Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Kolkata was held in 18th August 23 the premises of the Calcutta Mathematical Society. The mode of the conference over offline mode.

- **Foundation Day Celebration :**

  Calcutta Mathematical Society, Kolkata, India is going to organize a Webinar on History of Science on 06th September, 2023 to celebrate its 116th birthday. The speaker is Prof. Dipak Kumar , Former Professor, History of Science and Education Z.H. Centre of Educational Studies ,Jawaharlal Nehru University , New Delhi, India. Time: 11:00 AM - 12: 30 PM (Indian Standard Time).

- **Advanced Mathematical Ability Test for Class XI & XII:**

Calcutta Mathematical Society will conduct an Advanced Mathematical Ability Test for the students of class XI and XII to celebrate its 116th Foundation Day on 6-th September. The test will be held in online mode on 6th September, 2023 between 2:00 p.m.– 3:00 p.m. All of the participants received E-Certificate for participation after duly submission of feedback from. Students from Kolkata and other districts of West Bengal participated in the test. Shortlisted candidates called for interview and best students were awarded.

- **International Conference on Advancement of Mathematical Sciences and Computer Vision (ICAMSCV) held during 09-11 December, 2023 in hybrid mode at the Calcutta Mathematical Society :**

  The present International Conference on Mathematical Sciences and Computer Vision (ICAMSCV-2023) has been organized during December 09 to 11,2023 at the premises of the Calcutta Mathematical Society. The mode of the conference over offline and online (hybrid)mode. Students, Faculty members and Research Scholar from various disciplines of Mathematical Science are able to join the seminar.
  Hard Copy of Certificate will be provided to offline participants and Soft copy of certificate will be provided to the online participant.

- **Brief Report (Highlights) of International Conference on Advancement of Mathematical Sciences and Computer Vision (ICAMSCV-2023) held during 09-11 December, 2023 in hybrid mode at the Calcutta Mathematical Society.**

  ICAMSCV-2023 is believed to have had a significant impact on society from an educational perspective, as numerous distinguished scientists and mathematicians engaged in fruitful exchanges of their findings and deliberated on the practical applications of their results for societal improvement.
  On the first day after the Inaugural program, N. R. Sen memorial lecture was delivered by Prof. Dr. Swagatam Das of ISI, Kolkata and Prof. Arjen Doelman of Leiden University, Netherlands, delivered S. N. Bose memorial lecture in online mode. Dr. Haider Banka of IIT, ISM, Dhanbad, Dr. Saurabh Trivedi and Dr. Abhitosh Upadhyay of IIT, Goa, Dr. Rajat Banerjee of CGCRI, CSIR, Prof. Tanmoy Som of IIT, BHU, Dr. Akram Ali of King Khalid University, Saudi Arabia presented an Invited talk during the three days' conference. Prof. Dr. N. T. Dung, VNU, Vietnam delivered the Cullis Memorial lecture in online mode and Dr. Santanu Manna of IIT, Indore delivered Saha & Saha Memorial lecture.
  All the memorial lectures and invited talks provided invaluable insights into various research areas for both young participants and faculty members alike.

  In total, 54 papers were presented during the event, with 10 of them being presented in online mode.
  In the conference, the research topics covered from various sections of mathematical sciences that include Mathematical Analysis, Algebraic Topology, Computer Science, Artificial Intelligence, Nature-inspired Optimization, Geometric Analysis, Soft Computing, Mathematical Modelling & Simulation, and Space Sciences.
  In the valedictory session, we had the honour of presenting the prestigious P. K. Ghosh Memorial Award and S. N. Bagchi Memorial Award to two outstanding students from the postgraduate class of the University of Calcutta. Also, the awards were bestowed upon the

top rank holders of the “Advanced Mathematical Ability Test” organized by the Calcutta Mathematical Society.

The conference concluded with a vote of thanks extended to all participants, speakers, sponsors, and organizers for their invaluable contributions and support. Feedback from the participants was gathered to evaluate the success of the event and noted some points for improvement. Finally, discussions were held regarding the next course of action to be under taken by the society.

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Prof. Arindam Bhattacharyya

Secretary

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