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Self-Assessment Report

SAR 2024-25

Criterion 6: Faculty Profile & Research Activities

Sub Criterion 6.7 Paper Publish in UGC & Non-UGC care list

6.7.1 Paper Publish in UGC care list

6.7 Paper Publish in UGC & Non-UGC care list:

6.7.1 Paper Publish in UGC care list:

Sr. No.	Name	Title	ISSN No.	Published Date	Journal	Volume
1.	Renu Bala	Saez-Ballester Theory of Gravitation for Anisotropic Viscous Fluid Cosmological Models	0378-1143	2024	Annals of the Bhandarkar Oriental Research Institute	D1
2.	Dr. Poonam Sharma	A study on lgbtq in indian english literature: Celebration of self-existence Through spirituality in the poems of Hoshang merchant and Sunitinamjoshi	0972-0766	2023	International Journal of Creative Research Thoughts	XCVI, No.:06
3.	Dr. Arun Kumar	Some trace inequalities of a special type of Rhotrix	PP57-67	2022	GANITA	72(I)
4.	Prof. Ajay Kumar	Result on Picards Solution Dependence on Initial Conditions of Fractional order system	PP155-167	2024	GANITA	74(II)
5.	Dr. Arun Kumar	On Constructions of Maximum Distance Separable Pascal-Like Rhotrices over Finite Fields	ISSN: 1932-9466	2024	Applications and Applied Mathematics: An International Journal (AAM)	Special Issue No. 12 Article 9, 15 pages
6.	Anil Verma	Physiological and Nutritional Adaptation Mechanisms of Domestic and Wild Animals in Upper Himalayan Region: A Review	ISSN : 2394-1081	2024	Journal of Advances in Biology & Biotechnology	Volume: 28 NO.: 6 Page No(s): 1011-1017 DOI : 10.9734/jabb/2025/v28i62459
7.	Anil Verma	Assessment in the Age of Education 4.0: Unveiling Primitive and Hidden Parameters for Evaluation	ISSN: 2078-2489	2024	MDPI Information	DO: https://doi.org/10.3390/info15080486

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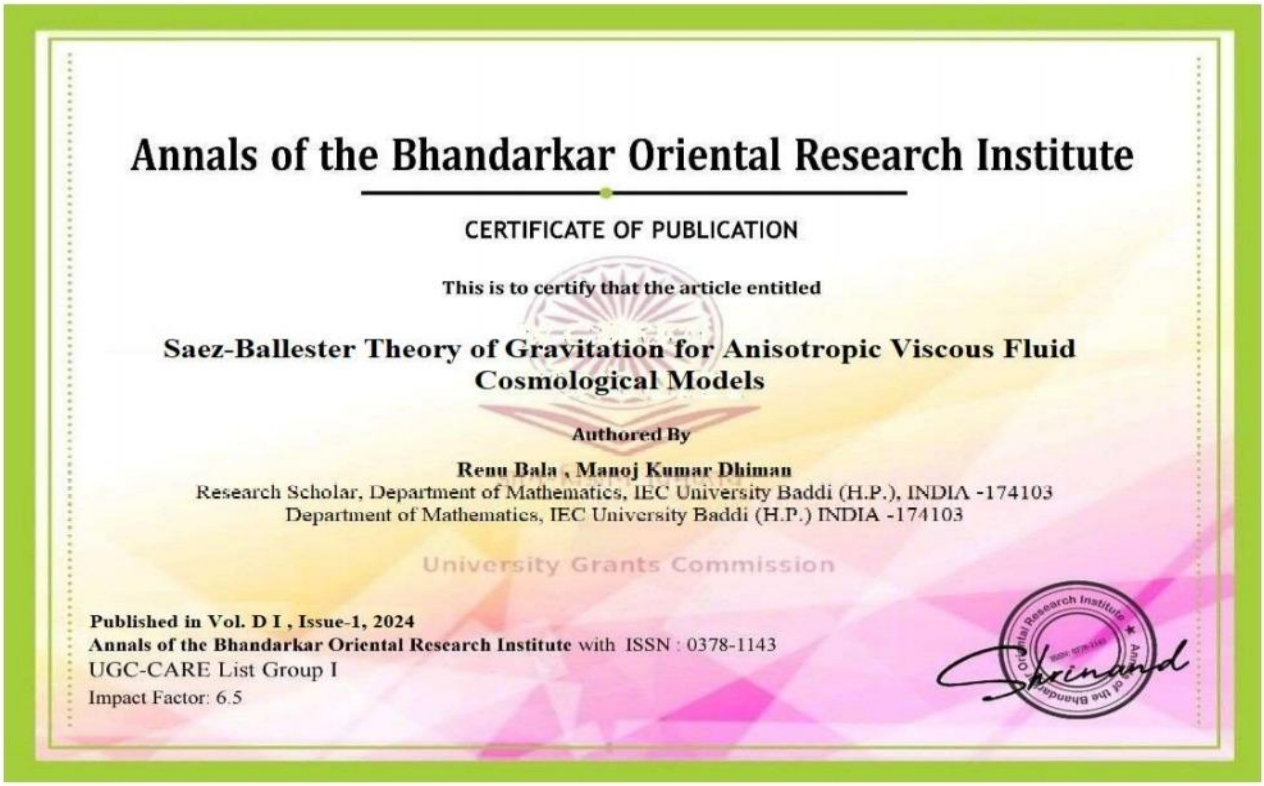

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Authored By

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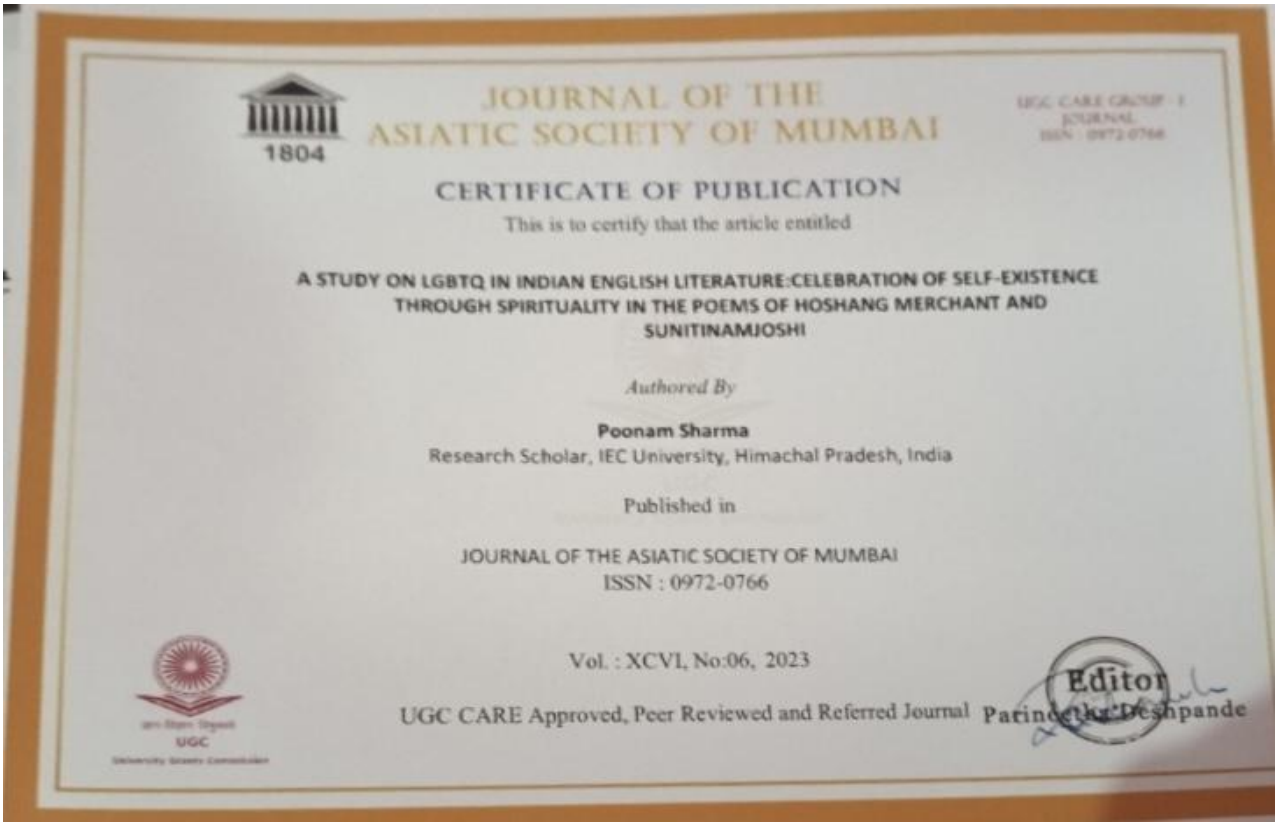

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Some trace inequalities of a special type of Rhotrix

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Abstract

Matrices play an important role in various branches of mathematics such as coding theory, combinatorics and cryptography. Rhotrices are represented by coupled matrices and have wide range of applications in graph theory, cryptography and coding theory. Here, we discuss some trace inequalities of $n-$dimensional special type of rhotrix. Also, we derive some results related to the eigen values of special type of rhotrix.

Subject Classification:[2010] 15A09, 20H30, 11T71.

Keywords: Rhotrix, Trace, Eigen values, Determinant.

1 Introduction

In 2003, Ajibade [2] introduced rhotrix which is a mathematical object some way between 2×2-dimensional and 3×3- dimensional matrices. Dimension of a rhotrix is always an odd number. A rhotrix of 3-dimension is defined as

$$R_3 = \left\langle \begin{array}{ccc} & a & \\ b & c & d \\ & e & \end{array} \right\rangle,$$

where a, b, c, d, e are real numbers. The heart of the rhotrix is c, denoted by $H(c)$. Let

$$Q_3 = \left\langle \begin{array}{ccc} & f & \\ g & h & j \\ & k & \end{array} \right\rangle$$

be the another rhotrix of same dimension and addition of two rhotrices is defined as

$$R_3 + Q_3 = \left\langle \begin{array}{ccc} & a & \\ b & c & d \\ & e & \end{array} \right\rangle + \left\langle \begin{array}{ccc} & f & \\ g & h & j \\ & k & \end{array} \right\rangle = \left\langle \begin{array}{ccc} & a+f & \\ b+g & c+h & d+j \\ & e+k & \end{array} \right\rangle.$$

Sani [8] extended rhotrix of $n-$dimension to any odd number $n \geq 3$ and gave the row-column multiplication. Sani [7] introduced heart oriented rhotrix multiplication and inverse of a rhotrix as

$$R_3 \, o \, Q_3 = \left\langle \begin{array}{ccc} & a & \\ b & c & d \\ & e & \end{array} \right\rangle \left\langle \begin{array}{ccc} & f & \\ g & h & j \\ & k & \end{array} \right\rangle = \left\langle \begin{array}{ccc} & af+dg & \\ bf+eg & ch & aj+dk \\ & bj+ek & \end{array} \right\rangle$$

GANITA, Vol.74(2), 2024, 155-167

RESULTS ON PICARD'S SOLUTION DEPENDENCE ON THE INITIAL CONDITIONS OF FRACTIONAL ORDER SYSTEMS

JAG MOHAN ✉, ANJU SOOD and AJAY KUMAR

Abstract

Fractional differential equations find widespread application in engineering domains, including control engineering, electronic system development, electronic circuit design, and speech modeling. Due to the analytical intractability of many such equations, numerical methods have been developed to obtain solutions. This study explores the sensitivity of solutions obtained through Picard's method for a fractional order system represented as ${}_{x_0}^{C}D_x^{\alpha}y(x) = f(x,y)$, subject to the initial condition $y(x_0) = y_0$, in which derivative has been taken in caputo sense. The research investigates how slight variations in the initial condition and the function $f(x,y)$affect the solutions. This analysis provides valuable insights into the stability and robustness of solutions for fractional differential equations, enhancing their practical applicability in diverse engineering applications.

2010 *Mathematics subject classification:* primary 26A33; secondary 34A08.
Keywords and phrases: Caputo Fractional Order Differential Equations, Picard's Iterative Method, Initial Value Problem, Existence and Uniqueness Theorem.

1. Introduction

Fractional order differential equations have gained significant importance recently, owing to their versatile applications across various scientific and engineering domains. These equations find practical use in control theory, signal processing, electric circuits, and modeling viscoelastic materials. Additionally, they offer valuable insights in population modeling, particularly in situations like epidemics or wars, where traditional integer-order models fall short [1–11] . In various real-life scenarios, integer order differential equations fall short in accurately representing the complexities of the problems. In such cases, fractional order models emerge as valuable alternatives, offering improved results. However, similar to their integer counterparts, many fractional order differential equations lack analytic solutions, necessitating the use of numerical methods for finding solutions. Given the challenges and importance of fractional order differential equations, our focus has been on developing numerical techniques to tackle these complexities effectively. As a result, in recent times, a diverse range of

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On Constructions of Maximum Distance Separable Pascal-Like Rhotrices over Finite Fields

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Abstract

Cryptography and coding theory are the important areas where Maximum Distance Separable (MDS) matrices are used extensively. The Pascal matrix plays vital role in combinatorics, matrix theory and its properties provide interesting combinatorial identities. Pascal matrices also have a wide range of applications in cryptography. In this paper, we define Pascal-like rhotrix, and further, we construct MDS Pascal-like rhotrices over finite fields.

Keywords: Pascal matrix; MDS matrix; Coupled matrices; Rhotrix; MDS rhotrix; Pascal-like rhotrix; Cryptography

MSC 2010 No.: 15B99; 20H30

Journal Articles Journal of Advances in Biology & Biotechnology Year : 2025

Physiological and Nutritional Adaptation Mechanisms of Domestic and Wild Animals in Upper Himalayan Region: A Review

Rishika Vij (1) , Suruchi Sharma (1) , Anjali Somal (1) , Geetanjali Singh (1) , Subhash Verma (2) , Anil Verma (3) , Nipuna Thakur (1) , Parul Shukla (4) , Parvesh Kumar (5)

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Abstract en

The upper Himalayan region's wild and domesticated animals have unique morphological, physiological, and dietary adaptations that allow them to survive in harsh weather. Specialized evolutionary mechanisms that promote thermoregulation, effective metabolic activities, and optimal nutrition assimilation are required because to the interplay of altitude, oxygen availability, temperature change, and unique dietary resources in these harsh environments. Yak (Bos grunniens), Churu, and Tibetan Wild Ass (Equus kiang) are among the 32 wild and 8 domestic animal species whose adaptive tactics are extensively examined in this analysis. These animals are resilient in high-altitude environments because of unique genetic and physiological changes they have experienced. Conservation biology, livestock management, and maintaining human populations that rely on these animals for agriculture all depend on an understanding of these adaptations. Understanding these adaptations is crucial for conservation biology, livestock management, and sustaining human populations dependent on these animals for agriculture, transportation, and ecological equilibrium in the region.

Domains

Biological anthropology

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Article

Assessment in the Age of Education 4.0: Unveiling Primitive and Hidden Parameters for Evaluation

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Abstract: This study delves into the nuanced aspects that influence the quality of education within the Education 4.0 framework. Education 4.0 epitomizes a contemporary educational paradigm leveraging IoT devices, sensors, and actuators to facilitate real-time and continuous assessment, thereby enhancing student evaluation methodologies. Within this context, the study scrutinizes the pivotal role of infrastructure, learning environment, and faculty, acknowledged as fundamental determinants of educational excellence. Identifying five discrete yet crucial hidden parameters, awareness, accessibility, participation, satisfaction, and academic loafing, this paper meticulously examines their ramifications within the Education 4.0 landscape. Employing a comparative analysis encompassing pre- and post-implementation scenarios, the research assesses the transformative impact of Education 4.0 on the educational sector while dissecting the influence of these hidden parameters across these temporal contexts. The findings underscore the substantial enhancements introduced by Education 4.0, including the provision of real-time and continuous assessment mechanisms, heightened accessibility to educational resources, and amplified student engagement levels. Notably, the study advocates for bolstering stakeholders' accountability as a strategic measure to mitigate academic loafing within an ambient educational milieu. In essence, this paper offers invaluable insights into the intricate interplay between hidden parameters and educational quality, elucidating the pivotal role of Education 4.0 in catalyzing advancements within the education industry.

Keywords: Education 4.0; IoT; hidden parameters; assessment

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1. Introduction

In recent years, the emergence of Education 4.0 has redefined the educational landscape by integrating cutting-edge technologies such as IoT devices, sensors, and actuators. These innovations aim to enhance real-time and continuous assessment methodologies, thereby improving the overall quality of education. However, the transition to this new paradigm necessitates a deeper understanding of various underlying factors that may influence educational outcomes. This study revolves around the following research question:

> "How do hidden parameters such as awareness, accessibility, participation, satisfaction, and academic loafing influence the quality of education within the Education 4.0 framework?"

This question guides our exploration of the pivotal role these hidden parameters play in the successful implementation of Education 4.0 and their impact on enhancing student evaluation methodologies. Infrastructure, learning environment, and faculty are the three basic criteria that national and international education evaluation agencies use to assess educational institutions [1–3]. These criteria are essential for ensuring that educational institutions can offer a setting that encourages learning and success for students. This