Government Arts and Science College, Ratlam (M.P.)

SOUVENIR

International Conference

(Hybrid Mode)

on

Current Developments
in Mathematical Sciences and E-Learning

Orgainzed by

Department of Mathematics and Statistics

16 January 2023

INTERNATIONAL CONFERENCE
(Hybrid Mode)
On

"Current Devlopments in Mathematical Sciences

and E-Learning"

16 JANUARY 2023

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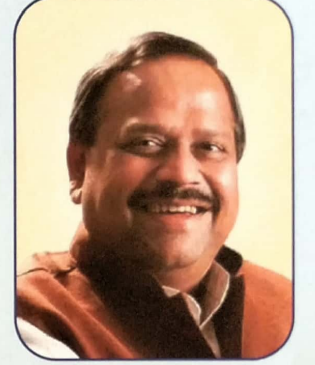
विधायक–रतलाम शहर
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: शुभकामना संदेश :

यह जानकर प्रसन्नता हुई कि शासकीय कला एवं विज्ञान महाविद्यालय के गणित एवं सांख्यिकी विभाग द्वारा 16 जनवरी 2023 को **"Current Developments in Mathematical Science and E-learning"** का आयोजन किया जा रहा है।

निश्चित रूप से यह संगोष्ठी देश और विदेश के विद्वानों को विचारों के आदान–प्रदान हेतु एक मंच प्रदान करेगी।

महाविद्यालय को इस आयोजन हेतु बधाई एवं इस अंतर्राष्ट्रीय शोध संगोष्ठी की सफलता हेतु शुभकामनाएं।

चेतन्य कुमार काश्यप

विनोद करमचन्दानी
अध्यक्ष
जनभागीदारी समिति
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JBS President's Message

This is as occasion of pleasure that our institute organizing an International Conference on "Current Developments in Mathematical Sciences and E-Learning."

I wish to congratulate the department of Mathematics and Statistics for their initiative that will surely encourage the participants in the positive direction of learning.

This also fills me with joy to learn that the event is conducted in "Hybrid Mode" availing exclusive insights of eminent speakers from India and abroad. This will definitely enrich the experience of the conference.

My warm wishes and congratulations for the "Souvenir" of the conference.

Vinod Karmchadani
(President JBS)
Govt. Arts and Science College, Ratlam

Principal's Message

It gives me immense pleasure that our institute Govt. Arts and Science college, Ratlam (MP) is organizing one day national International Conference on "Current Developments in Mathematical Sciences and E-Learning" 2023, January, 16.

I am sure that this Conference will strive to offer plenty opportunities to meet the research scholars, academicians, students, industry experts to spread Knowledge on scientific research in interdisciplinary areas. This will trigger discussions on practical challenges and suggest solutions, thus consolidating the recent innovation.

Organizing such academic events in the institution students, teachers and research scholar will be benefited immensely and widen the horizon of their knowledge, work experience in the field of mathematics and E-learning.

In current Scenario E-Learning has vital importance in education modern education. Modern education doesn't just only focus on prominent academic disciplines of science, Arts and commerce but also aims to faster critical thinking, life skills, value education, analytical skills and decision-making skills in students.

To develop various Kinds of skills in students the basic knowledge of mathematics is essential. Hence, seminar topic has much relevance.

I give my best wishes to all delegates, and organizers of this seminar to make this event a grand success.

DR. Y.K. Mishra
Principal
Govt. Arts and Science College,
Ratlam (M.P.)

Detailed Programme

Monday, January 16 , 2023

Time		
9:30-10:00	**Registration and Breakfast**	
10:00-10.30	**Inaugural Ceremony and Welcome Address**	
10:30-11:15	Dr. Dhanesh Patel	Keynote address

Session I- Plenary Lectures

Room G-6   **Chair : Dr. Dhanesh Patel**

Time		
11:15-11:45	Dr. M. Vijay Kumar	The importance of mathematical analysis in the development of daily life and applications
11:45-12:15	Dr. V. N. Mishra	Approximation of functions by some positive linear operators
12:15-12:45	Dr. P. Tripathi	Time series analysis: the stochastic volatility models and their applications
12:45-1:45	Lunch Break	

Room G-6	Session II- Plenary Lectures on E-Learning (online mode)	Chair : Dr. M. Vijay Kumar
13:45-14:15	Dr. Magdalena Roszak	E-learning practice and future education at Universities in Poland
14:15-14:45	Dr. Iwona Mokwa-Tarnowska	E-learning practice and future education at Universities in Poland
14:45-15:15	Dr. Joanna Markowska	E-learning practice and future education at Universities in Poland
15:15-15:45	Dr. Agnieszka Heba	Innovation methods of teaching Mathematics at University with using the Geogebra application."
15:45-16:00	Tea break	
Room G-6	Session IIIA- Parallel Technical sessions - I	Chair : Dr. V.N. Mishra
16:00-16:10	R K Gujetiya	Some Fixed and Common Fixed Point Theorem in Banach 2-Space
16:10-16:15	Manoj Kumar	A fixed point theorem for weak ($-$) hybrid contraction
16:15-16:20	Asha Rani	Stability of Generalized Quadratic Functional Equation
16:20-16:35	Amrish Handa	Coupled coincidence point results for weak ψ-ϕ contraction on partially ordered metric spaces with application
16:35-16:40	Chetna Kothari	Common fixed point result for generalized weakly compatible pair of mappings under new contractive condition

Time	Name	Title
16:40-16:45	Suresh Chouhan	Employing generalized Mizoguchi-Takahashi contraction in common fixed point theorem under new weaker condition
16:45-16:50	Manoj Kumar	The Stability of A-Quartic Functional Equations in Fuzzy Normed Spaces
16:50-16:55	Gourav Sharma	Common Fixed Point Theorems for Weak – Contractions in Complete Bipolar Metric Spaces
16:55-17:00	Nagalaxni Nakeertha	Generalized Harmonic functions with varying coefficients and Applications
17:00-17:05	Rajnandni Hedriya	Common Fixed point theorems on fuzzy quasi-metric space
17:05-17:10	Sakina Othmani	Synchronization control of a class of recurrent neural networks with time delays
17:10-17:15	Teki Sivakrishna	Generalized common fixed point theorems with fuzzy metric spaces and their application
17:15-17:20	Kusuma Tummala	Fixed point theorems in R–metric spaces and Fuzzy Metric space with Applications
17:20-17:25	M L L Phanikanth	Fixed point theorems in complete Fuzzy Metric spaces
17:25-17:30	Dheeraj Singh	Common fixed point result in complex valued H-Metric spaces under contractive condition
17:30-17:35	Madhavi Jetti	Common Fixed Point Theorems of Ćirić Type in Fuzzy Metric Spaces and their applications
17:35-17:40	A.Padma	Common coupled fixed point theorem in intuitionistic Menger metric space and applications

Time	Name	Title
17:40-17:45	Minaxi	Heat and Mass Transfer with Free Convection MHD Flow Past a Vertical Plate Embedded in a Porous
17:45-17:50	Uma M.	Generalized on fixed points in fuzzy metric spaces through weak compatibility
17:50-18:00	Nagalaxmi Nakeertha	Generalised Harmonic functions with varying coefficients and Applications
18:00-18:10	Sonal Jain	Common Fixed point theorems on intuitionistic fuzzy quasi-metric space
18:10-18:20	T. Srinivas	Symmetric Key Generation Based on Pythagorean Triples
18:20-18:30	Yashwant K Panwar	Sums of Bivariate Fibonacci and Bivariate Lucas Polynomials

Session IIIB- Parallel Technical sessions - II

Chair : Dr. P. Tripathi

Room 48	Name	Title
16:00-16:10	Bhawana Bhatt	A Brief Understanding of Knowledge Graphs
16:10-16:20	N. Mangal	Design and Investigation of Mathematical Model for the Vaccination and Transmission of Monkeypox Virus without lifelong Immunity
16:20-16:30	Sanjay Sharma	Vitality of Mathematical Sciences in Current Scenario: A Review
16:30-16:40	Sarita	Mathematics in Sociology and Application
16:40-16:50	Shweta Shrivastava	Mathematics for Scenarios of Biodiversity and Ecosystem with their Application
16:50-17:00	Varun Parmalaand	Application of Genetic Algorithms to Inventory Model with Freshness dependent Segmentation, Discounted Price and Shortages

Time	Name	Title
17:00-17:10	Anis Mohammed	Student behavior and E-learning
17:10-17:20	Heena Chawla	Measles Statistics in India
17:20-17:30	Kirti Vishwakarma	A literature review on mathematical concept & challenges of e-learning
17:30-17:40	NITISH ADAWADKAR	Tuberculosis Statistics in India
17:40-17:50	Rizwan Ishak	Cancer Statistics in India
17:50-18:00	Shefali Gupta	An overview of the Mental health status in India and across the Globe
18:00-18:10	Taniya Jonwal	AIDS Statistics in India
18:00-18:05	Hitesh Sankhala	COVID-19 and e-learning
18:05-18:10	Priyanka Chauhan	A study to assess the impact of e-learning on students of selected college of Ratlam district
18:10-18:15	Sanjeev Pamari	Bayesian Inference of parameters for Weibull distribution when observations are censored
18:15-18:20	Nirmala Dabi	Artificial Intelligence and Computational Methods: Optimization of Complex Systems
18:20-18:25	Vijaya Kushwaha	ई-लर्निंग द्वारा शिक्षकों का व्यक्तित्व विकास
18:25-18:30	Deependra S. Pal	Bayes Prediction for Pareto distribution when observations are progressively censored
18:30-18:40	Valedictory session	

Innovative methods of teaching mathematics at University with using the Geogebra application

Dr. Agnieszka Heba

Department of Political Sciences and International Studies
University of Warsaw, Poland

GeoGebra is free software to help in the teaching process of mathematics, physics, economics, computer science, etc. It is used by many teachers and students in the learning process, at all levels of education, from primary school to university. It is an easily accessible programme. It can be downloaded from http://www.geogebra.org. To use GeoGebra, it is only necessary to install the Java environment.

GeoGebra combines algebra, geometry, graphs and tables. It facilitates the understanding of mathematical concepts through the construction and creation of different mathematical models. It is a very good learning support tool for both "newbies" in mathematics and professionals.

The software enables teachers to make the subject teaching process more attractive and varied by going beyond the blackboard and white chalk. The creation of mathematical models by students using GeoGebra makes mathematics more accessible to them through its interactivity and dynamism. As a result, they can achieve better academic results and teachers can derive more satisfaction by creating more interesting lessons.

GeoGebra is a very good tool for drawing graphs of functions and discussing their properties. Already at the primary school level, when solving systems of equations graphically on the basis of a simple applet, students can be familiarised with the relationship between linear functions and solutions of systems of equations.

Creating applets in GeoGebra is intuitive; knowledge of programming principles is useful but not essential. Individual items can be selected from the menu at the top of the editing window, and it is also possible to enter text commands on the command line. Depending on our needs, you can use the following views:

- algebra view – ability to create, among other things: variables, function formulas, straight lines, conics, etc;
- two graphics views – creation of geometric objects, graphs of functions, as well as the possibility of creating a graphical interface;
- spreadsheet view;
- construction protocol view;
- CAS (Computer Algebra System) – a simple computer algebra system;
- and since version 5.0 a view of three-dimensional graphics;
- view of the probability calculator.
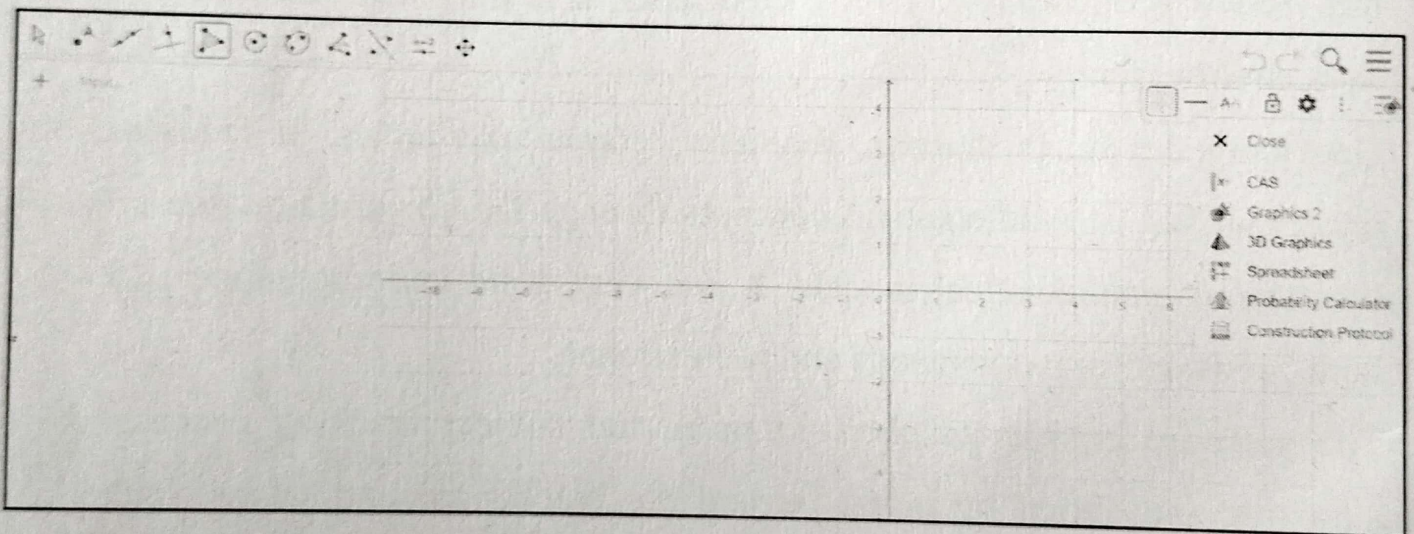
Matrix Operations of +, -, and *

Autor: Nevin Hopkins

Matrix operations. Addition, subtraction and multiplication require two matrices.

Compute the Following

$$\begin{pmatrix} 0 & 2 & -3 \\ 3 & 6 & 6 \\ 6 & 5 & 1 \end{pmatrix} - \begin{pmatrix} 3 & 2 & 7 \\ 7 & -5 & -3 \\ 0 & 5 & 7 \end{pmatrix}$$

☑ Show Answer

$$\begin{pmatrix} -3 & 0 & -10 \\ -4 & -1 & 9 \\ 6 & 10 & 6 \end{pmatrix}$$

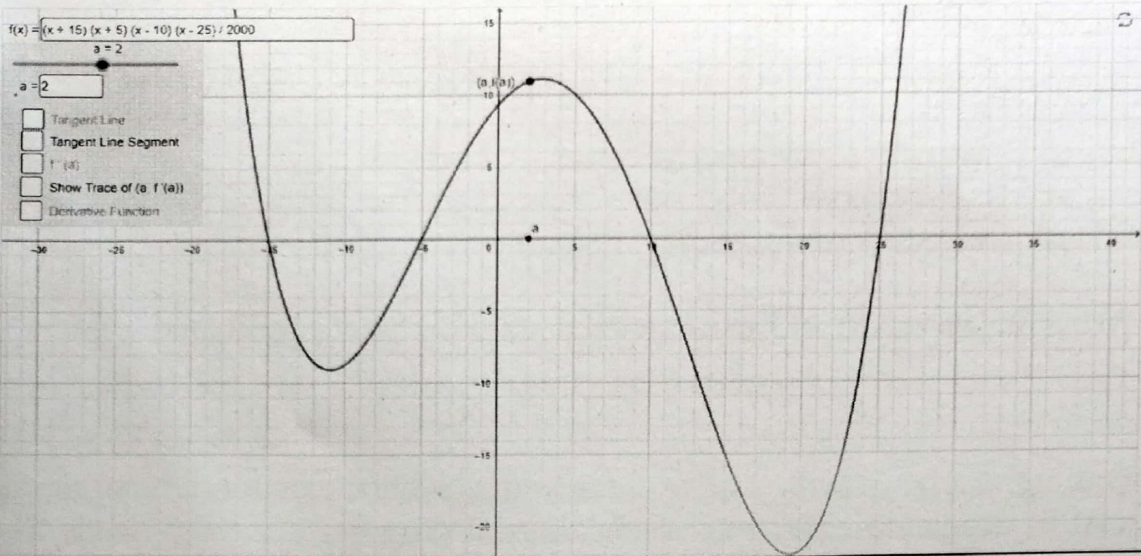# Introducing the Derivative Function 1

Autor: Dr. Jack L. Jackson II

Temat: Pochodna

$f(x) = (x + 15) (x + 5) (x - 10) (x - 25) / 2000$

a = 2

a = 2

- Tangent Line
- Tangent Line Segment
- f '(a)
- Show Trace of (a f '(a))
- Derivative Function

3

E-learning practice and future education at universities in Poland.

Magdalena Roszak1, Iwona Mokwa-Tarnowska2, Joanna Markowska3

1.Poznan University of Medical Sciences, Poland

2. Gdansk University of Technolog, Poland

3. Wrocław University of Environmental and Life Sciences, Poland

E-learning is a new method of working with students, which is becoming more crucial in academic education. Technological progress inevitably leads to the implementation of up-to-date technologies in distance education. The advantages that e-learning offers leads students to turn to the Internet and multimedia sources of knowledge more than they turn to traditional textbooks. Therefore, it seems appropriate to implement e-learning and provide access to multimedia materials that include reliable educational content, which can replace and/or support traditional classes. The application of the e-learning can be a source of competitive advantage for the university. It can considerably contribute to the quality and efficiency of contemporary university education.

E-learning, blended learning and web-enhanced classes help students increase hard and soft skills, including analytical, reflective and critical thinking. Online environments motivate them to work individually and collaboratively to deliver a variety of simple assignments and complex projects; they enable them to develop creativity and specialist knowledge through the use of varied tools, context-specific tasks, and new learning practices such as gamified experiences, which capture imagination and stimulate curiosity. This results in improved engagement and more intensive learning than in a traditional setting. New educational environments also unlock the innovative potential of the educators involved in their development.

An important issue in conducting e-learning at universities is both institutional and academic community support. Effective support for the implementation of e-learning processes must be preceded by a formalization process, i.e. who provides support and to what extent, the required competences, who it concerns and what organizational models of e-learning are implemented. Providing support results in good practices. However, Good Practices are closely related to the structure of the organization, such as: size, culture and financial capabilities. In addition, in education and improving skills, expanding knowledge, different target groups and their needs should be taken into account. Good Practices reflect the nature of the organization.

The importance of mathematical analysis in the development of daily life and applications

By M. Vijay Kumar

Approximation of functions by some positive linear operators

Vishnu Narayan Mishra

Department of Mathematics, Indira Gandhi National Tribal University, Lalpur, Amarkantak 484 887, Madhya Pradesh, IndiaE-mail: vnm@igntu.ac.in, vishnunarayanmishra@gmail.com, vishnu_narayanmishra@yahoo.co.in

Abstract

Approximating the high-order polynomial curves and curved surfaces with the low-order ones plays an important role in data compression, data transmission, and data exchange, etc., in geometric modeling tasks. Generally, it is also an important research topic in Computer Aided Design (CAD). In recent years, the research on Bézier curve approximation with degree reduction attracts lots of attention. Current algorithms for Bézier Curve degree reduction can be summarized into two categories. The first category is based on the base function conversion. For instance in reference [Lu, L. Z., & Wang, G. Z. (2008). Application of Chebyshev II-Bernstein basis transformations to degree reduction of Bézier curves. Journal of Computational and Applied Mathematics, 221, 52-65] propose to utilize the Chebyshev Polynomials for base function conversion. In reference [Sánchez-Reyes, J. (1997). The symmetric analogue of the polynomial power basis. ACM Transactions on Graphics, 16, 319-357], Sánchez-Reyes uses the S power base to accurately represent the Bernstein base function. Farouki proposes the degree reduction algorithm based on the Legendre Polynomials in reference [Rida, T. F. (2000). Legendre-Bernstein basistransformations. Journal of Computational and AppliedMathematics, 119, 145-160].The second category can be summarized as the geometric approximation algorithms with the control vertexes.

Approximation theory is the branch of mathematics which studies the process of approximating general functions by simple functions such as polynomials, finite elements or Fourier series.Approximation processes arise in a very natural way in many problems dealing with the constructive approximation of functions as well as solutions to (partial) differential equations and integral equations. The study of such subject falls into an intensive research area, developing in different directions by many mathematicians. Several investigations have been devoted to the approximation properties of new sequences of operators, which

might generalize or modify well-known ones, in order to get better results. Issues related to these studies are, for instance, shape preserving properties of the approximating operators, estimates of the rate of convergence, asymptotic formulae, saturation problems, approximation of semigroups of operators, asymptotic behavior, direct, and converse results. Several approximation processes have been successfully applied for example in Computer Aided Geometric Design, in the theory of artificial neural networks, and in evolution problems arising in population genetics, financial mathematics, and other fields.Summability techniques were also applied on some engineering problems like Chen and Jeng [J. T. Chen and Y. S. Jeng, Dual series representation and its applications to a string subjected to support motions, *Advances in Engineering Software*, vol. 27, pp. 227–238, 1996] who implemented the Cesàro sum of order $(C, 1)$ and $(C, 2)$, in order to accelerate the convergence rate to deal with the Gibbs phenomenon, for the dynamic response of a finite elastic body subjected to boundary traction. Chen et al. [J. T. Chen, H.-K. Hong, C. S. Yeh, and S. W. Chyuan, Integral representations and regularizations for a divergent series solution of a beam subjected to support motions, Earthquake Engineering and Structural Dynamics, vol. 25, pp. 909–925, 1996] applied regularization with Cesàro sum technique for the derivative of the double layer potential. Similarly, Chen and Hong [J. T. Chen and H.-K. Hong, Review of dual boundary element methods with emphasis on hypersingular integrals and divergent series, ASME Applied Mechanics Reviews, vol. 52, pp. 17–33, 1999] used Cesàro sum regularization technique for hypersingularity of dual integral equation.

The goal of this talk is to attract researchers as well as scientistswho are working in the recent advances in operator methods in approximation theory and related applications.

Potential topics of this talk include but are not limited to the following:
- Approximation by positive operators
- Approximation by linear/nonlinear operators
- Approximation by integral operators
- Rate of convergence and moduli of smoothness
- Simultaneous approximation
- Approximation problems for semigroups of operators and evolution equations
- Multidimensional problems
- Abstract approximation theory
- Quantum & Post Quantum Calculus in Approximation Theory

The theory of summability arises from the process of summation of series and the significance of the concept of summability has been strikingly demonstrated in various contexts e. g. in Analytic Continuation, Quantum Mechanics, Probability Theory, Fourier Analysis, Approximation Theory and Fixed Point Theory. The methods of almost summability and statistical summability have become an active area of research in recent years. This short monograph is the first one to deal exclusively with the study of some summability methods and their interesting applications. We consider here some special regular matrix methods as well as non-matrix methods of summability. Broadly speaking,

signals are treated as functions of one variable and images are represented by functions of two variables. Positive approximation processes play an important role in Approximation Theory and appear in a very natural way dealing with approximation of continuous functions, especially one, which requires further qualitative properties such as monotonicity, convexity and shape preservation and so on. Analysis of signals or time functions is of great importance, because it conveys information or attributes of some phenomenon. The engineers and scientists use properties of Fourier approximation for designing digital filters. In this talk, we discuss the basic tools of approximation theory & determine the error (degree) in approximation of a signal (function) by different types of positive linear operators in various Function spaces like as in Lp-spaces. During this talk, few applications ofapproximations of signals will also be highlighted. Approximation processes arise in a very natural way in many problems dealing with the constructive approximation of functions as well as solutions to (partial) differential equations and integral equations. The study of such subject falls into an intensive research area, developing in different directions by many mathematicians. Several investigations have been devoted to the approximation properties of new sequences of operators, which might generalize or modify well-known ones, in order to get better results. Issues related to these studies are, for instance, shape preserving properties of the approximating operators, estimates of the rate of convergence, asymptotic formulae, saturation problems, approximation of semi groups of operators, asymptotic behavior, direct, and converse results. Several approximation processes have been successfully applied for example in Computer Aided Geometric Design, in the theory of artificial neural networks, and in evolution problems arising in population genetics, financial mathematics, and other fields. The goal of this talk is to attract researchers, engineers as well as scientists who are working in the recent advances in operator methods in approximation theory and related applications.

The study of sequence spaces occupies a very prominent position in analysis. The convergence problems have always been of great interest. The theory of sequence spaces has widely used in several branches of mathematics such as the structural theory of topological vector spaces, law of large numbers and the theory of functions. It has a significant contribution in enveloping the classical summability theory via matrix transformations from the one sequence space to another sequence space. The study of sequence spaces came into existence by special results in the theory of summability.

The concept of summability is the generalization of the concept of convergence. Summability is a theory of assigning the value to a series whose sequence of partial sums diverges. It is an extremely constructive area for the application of functional analysis. In 1890, Italian analyst Ernesto Cesàro was the first to deal with the sum of divergent series and defined Cesàro summation. Several alternative methods of assigning a value to an infinite series were invented by mathematicians; these are known as "summability methods". Some of the most familiar methods of summability are those that are associated with the names of great mathematicians like Hölder summability, Abel summability, Borel summability, Nörlund summability, Riesz summability etc.

7

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Time series analysis: the stochastic volatility models and their applications

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Abstract: Time series data are frequently available when a collection of raw facts are made in accordance of any time sequence. Any time series is affected by some long term and periodic causes, known as components of time series. The presentation discussed somecommon time series models. Apart from these,the emergence of several volatility models, particularly,the stochastic volatility model and its applicability on real life data of COVID-19 has been discussed. Also,an important extension of the univariate autoregressive model using stochastic volatility model has been explained along with its application on the gold pricedata.

Some Fixed and Common Fixed Point Theorem in Banach 2-Space

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Department of Mathematics,

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ABSTRACT: In this paper we prove fixed point and common fixed point Theorem in non-expansive and existence mappings using Banach 2-space for new rational expression. Which generalize the well known result.

A fixed point theorem for weak $(\psi - \varphi)$ hybrid contraction

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(*Corresponding Author)

Abstract: In this paper, we introduce a weak $(\psi - \varphi)$ hybrid contraction that combine several linear and non-linear contractions in the context of a complete metric space. Dutta and Chaudhary's result is also derived as a corollary. To demonstrate the validity of the proven result, we provide an example.

Keywords: Altering distance function, complete metric space, fixed point, weak $(\psi' - \varphi)$ hybrid contraction.

Mathematical Subject Classification 2010: 47H10, 54H25.

Student behavior and E-learning

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More recently, technological advances have changed user behavior and usage patterns in different areas of learning patterns, resulting in breakthroughs in pedagogy. However, in recent years, researchers have shown a great deal of interest in learning style, a key factor influencing the learning process in general. In recent decades, rapid advances in technology have improved learner behavior, and this new trend has changed the way teachers and teachers think about formal teaching and its application to the learning process. Introduction of various forms of e-learning. Computer-assisted learning, blended learning, Massive Online Open Courses (MOOCs), and more. It has become a reality in most universities in India and abroad. Against this background, some study was conducted questioning the effectiveness of e-learning in the learning process for knowledge promotion. We need to study and examines the effectiveness of using e-learning in the classrooms of local educational institutions. The issue of sharing up-to-date information and employing modern communication skills for teaching and learning is becoming increasingly important in higher education.

Keywords: MOOCs, pedagogy, e-learning.

Stability of Generalized Quadratic Functional Equation

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Abstract: In this study, we prove the Hyers-Ulam stability of quadratic functional equation in the following form

$$\phi(-x_1-x_2+x_3+x_4)+\phi(-x_1+x_2-x_3+x_4)+\phi(-x_1+x_2+x_3-x_4)+\phi(x_1-x_2-x_3+x_4)+\phi(x_1-x_2-x_4+x_3)+\phi(x_1+x_2-x_3-x_4)=-2[\phi(x_1+x_2)+\phi(x_1+x_3)+\phi(x_1+x_4)+\phi(x_2+x_3)+\phi(x_2+x_4)+\phi(x_3+x_4)]$$

$$+12[(\phi(x_1)+\phi(-x_1))/2+(\phi(x_2)+\phi(-x_2))/2+(\phi(x_3)+\phi(-x_3))/2+(\phi(x_4)+\phi(-x_4))/2]+6[(\phi(x_1)-\phi(-x_1))/2+(\phi(x_2)-\phi(-x_2))/2+(\phi(x_3)-\phi(-x_3))/2+(\phi(x_4)-\phi(-x_4))/2],$$

in Random Normed Space (RN-Space) using direct method.

2010MSC: 39B82; 46S40; 46S50.

Keywords: Hyers–Ulam stability, Functional Equations, Random Normed spaces, Direct method.

Coupled coincidence point results for weak ψ-φ contraction on partially ordered metric spaces with application

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Abstract: We establish a coupled coincidence point theorem for generalized compatible pair of mappings F, $G: X \times X \to X$ under weak ψ-φ contraction on partially ordered metric spaces. We also deduce certain coupled fixed point results without mixed monotone property of $F: X \times X \to X$. An example supporting to our result has also been cited. We obtain the solution of integral equation to demonstrate the usability of the obtained results. We generalize several known results.

Common fixed point result for generalized weakly compatible pair of mappings under new contractive condition

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Abstract. We establish a common fixed point theorem for generalized weakly compatible pair of mappings F, G:X×X→X under new contractive condition on a non complete metric space, which is not partially ordered. An example supporting to our result has also been cited. We generalize several known results.

Employing generalized Mizoguchi-Takahashi contraction in common fixed point theorem under new weaker condition

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Abstract. We establish a common fixed point theorem for generalized weakly compatible pair of mappings F, $G:X\times X\to X$ without mixed monotone property under generalized Mizoguchi-Takahashi contraction on a non complete metric space, which is not partially ordered. An example supporting to our result has also been cited. We generalize several known results.

A Brief Understanding Of Knowledge Graphs

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ABSTRACT: Knowledge graphs have arose as a convincingconcept for shaping worldwide knowledge over the internet, and a technique to integrate information gathered from multiple data sources. Knowledge graphs have also started to play a vital role in incorporating representation for extracted knowledge, and for elucidationof what is learnt. Graphs are a centralidea in discrete Mathematics, and have applications in all areas of computer science. Most notable uses of graphs in knowledge representation and databases have taken the form of data graphs, taxonomies and ontologies. Knowledge graph being a directed labeled graph, can be used to extract algorithms and implementations from more general graph-based systems in Computer Science.The union of two different developments: data linking and sharing over the web and vision to extract relations from texts and images has driven recent flow in the use of knowledge graphs. In this paper our aim is to bring out usage of knowledge graphs in a simple way. We start with a brief introduction of knowledge graphs following with recently reported new and diverseapplicationsthat have added to the recent surge in the acceptance of knowledge graphs.

Measles Statistics in India

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INTRODUCTION: Measles is a highly contagious disease caused by paramyxovirus. It is one of the leading causes of death among children, despite the availability of a safe and effective vaccine.Measles immunization day is celebrated on 16 March.

METHODOLOGY: The global measles and rubella report is based on surveillance data reported by member states to the regional offices monthly or weekly. The regional compilation is reported to HQ monthly.

RESULTS: In 2018, measles killed more than 1,40,000 worldwide people according to WHO.India reported highest number of measles cases worldwide (11,055) of followed by Yemen(7914).Among states, Maharashtra reported most cases with 3075 cases and 13 deaths followed by Jharkhand with 2683 cases and 8 deaths.Measles case distribution by month and WHO region 2017-2022.Total cases in 2022 are 119493 MR Vaccination Campaign is a special campaign to vaccinate all children in age group 9 months to 15 years.GOI is undertaking measles elimination program intending to achieve target by December 2023.Covid 19 has increased the risk of measles outbreaks.

CONCLUSION-Measles Rubella Campaign 9 months-15 years: 324 million children vaccinated in 34 states

Impact of campaign: 71% decrease in measles

: 30% decrease in Rubella

:41% increase in Negative

Over 61 million doses of measles-containing vaccine were postponed or missed due to Covid-19   In India, measles cases more than doubled in first two months of 2022 compared to previous year. Globally, measles cases increased by 79% in the same period.

KEY WORDS-Measles-Elimination-MR-Campaign-covid-19-WHO

A LITERATURE REVIEW ON MATHEMATICAL CONCEPT & CHALLENGES OF E-LEARNING

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ABSTRACT: The association between four aspects of individual online learners and their mathematical self-concept was investigated in this methods study. The difficulties that students encountered when studying mathematics online during COVID-19 epidemic were also identified. The participants were students from two online math courses that were presented in the summer of 2020-22. Face-to-face learning sessions were suspended during this time because to the COVID-19 epidemic, so pure online courses were first made available. It was discovered that the computers used by students for online classes belonged to them. The two biggest issues with online learning were internet access and power outages. Students showed both positive and negative concepts when learning mathematics online. To some extent, individual characteristics were associated with mathematical concept. Qualitative research reveals that students struggled with test anxiety, personal, household, assessment, pedagogical, and technical issues.

Keywords: Capability, Math, Learning Management System, Physical Learning Space, mathematical concept.

Tuberculosis Statistics in India

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INTRODUCTION-Tuberculosis is an air borne infectious disease caused predominantly by Mycobacterium tuberculosis, it present with symptoms such as fever, cough, night sweats.

METHODOLOGY-The facts below are in accordance to India tb report2022.

RESULTS-2021 Witnessed A 19% Increase From The Previous Year In Tb Patient Notification.Total Number Of Incident Tb Patients Notified During 2021 Were 19,33,381 As Opposed To That Of 16,28,161 In 2020.The estimated mortality rate among all forms of TB was 37 per 1lac population in 2020 which has been increased to 11% in 2021 in country. There was 51 % cure rate observed in tribal tb patients of M.P along with the death rate of 4.3%.

CONCLUSION- NTEP has been able to catch up with the dip occurred in the two COVID waves through active case finding&bidirectional screening of TBCOVID19. Also the increase in mortality to 11 % had occurred as a result of the ongoing pandemic leading to impact in care-seeking,treatment services,closure of public facilities for TB care ,fear of contracting COVID by accessing facilities, interrupted supply of essential drugs.

KEY WORDS-Tuberculosis, COVID,Pandemic.

Abstract of Cancer Statistics in India

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Introduction: Cancer is the most/second most common cause of mortality in <70 age-group in 91 countries. Factors like rapid urbanization, population ageing,and unhealthy lifestylesare responsible for the emerging cancer burden in India.

Methodology: Data for the report was collected from various sources including NCRP, *Kulothunganetal*, MoHFW, Reports submitted in Parliament of India

Results:NCRP estimates incidence of cancer for 2022 at 14,61,427 (crude rate:100.4 per 100,000). This incidence rate is projected to increase by 12.8% by 2025. One in nine people in India has a life term risk of cancer.Seven leading cancers in India are lung (10.6%), breast (10.5%), oesophagus (5.8%), mouth (5.7%), stomach (5.2%), liver (4.6%), and cervix uteri (4.3%). In terms of DALYs, cancer burden of India for year 2021 was 26.7 million, which is projected to increase to 29.8 million in 2025. Highest impact of cancer burden is in North India (2408 DALYs per 100,000) followed by North-East (2177 DALYs per 100,000). Lung cancer contributed to highest DALY in men (183.3 per 100,000) followed by mouth (89.6 per 100,000) and oesophagus (89.4 per 100,000) while in womenbreast (232.7 per 100,000), cervix uteri (98.6 per 100,000), ovary (78.9 per 100,000),lung (74.1 per 100,000) takes top spots. In terms of Years lived with a disability(YLD), North India and North-East shows highest burden at 103 YLDsper 100,000. Risk of dying from cancer in

India before 75 years is highest in urban males (1 in 20) followed by rural females (1 in 22) and urban women (1 in 24). Estimated mortality is 7,70,230 in 2020 and it increased to 7,89,202 in 2021 and 8,08,558 in 2022.

Conclusion:A large variation in cancer sites was observed by age and sex. Cancer burden also varies between regions within the country. Estimated incidence, mortality and DALY is showing a rising trend in India.

Keywords: Cancer-estimates-incidence-India-National Cancer Registry Programme-DALY.

ABSTRACT: AN OVERVIEW OF THE MENTAL HEALTH STATUS IN INDIA ANDACROSS THE GLOBE

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INTRODUCTION: Mental health is an integral part of our general health and well-being and a basic human right. Having good mental health means we are better able to connect, function, cope and thrive. Mental health exists on a complex continuum, with experiences ranging from an optimal state of well-being to debilitating states of great suffering and emotional pain.

As the world comes to live with, and learn from, the far-reaching effects of the COVID-19 pandemic. Rates of already-common conditions such as depression and anxiety went up by more than 25% in the first year of the pandemic, adding to the nearly one billion people who were already living with a mental disorder.

BACKGROUND: Mental health is a lot more than the absence of illness: it is an intrinsic part of our individual and collective health and well-being. The main motive of the presentation is to get an overview of the epidemiological aspects of mental health across the globe from the WHO Mental Health Report 2020. It also includes the data related to National Mental health Survey 2015-16, highlighting the epidemiology of various mental disorders in India, and the status of mental health in India.

MATERIALS AND METHODS: Data shall be obtained and analysed from WHO Mental Health Report, 2020, and National Mental Health Survey, 2016. The relevant data to be complied and presented using Microsoft PowerPoint, 2021.

RESULTS: As per the global prevalence of mental disorders in 2019, 970 million people are suffering from mental disorders across the globe. The highest prevalent being anxiety disorders (31%) and depressive disorders (28.9%). All over the world, there was a greater increase in disorder prevalence among females (52.4%) than among males (47.6%). The present National Health Survey in India has estimated that nearly 10.7% of the Indian population suffers from a mental health illness.

KEYWORDS: Mental Health, Mental Disorders, Depression, Anxiety, COVID-19.

AIDS Statistics in India

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INTRODUCTION- AIDS, the acquired immune-deficiency syndrome is caused by retrovirus known as Human Immune-deficiency Virus(HIV) which break down the body's immune system, leaving the victim vulnerable to a hostage of life threatening opportunistic infections. The term AIDS refers only to the last stage of the HIV infections.

METHODOLOGY-Data for the report was collected from NACO.

RESULTS-At the national level, estimated adult HIV prevalence (15-49 years) is 21% in 2021. Overall, around 3% of PLHIV were estimated to be in age group of 0-14 years, 7% in the age group of 15-24 years while one third were 50 years or older. High prevalence noted in the north-eastern region with 3 states, Mizoram, Nagaland, Manipur with prevalence rate of more than 1%. However due to high population, the following states account for 72% of the total PLHIV size in country: Maharashtra (3.94 lakh), Andhra Pradesh (3.21 lakh), Karnataka(2.76 lakh), TN(1.63 lakh), Telangana (1.56 lakh), Bihar (1.43 lakh), and Gujarat (1.14 lakh). IPR has a declining trend in all states includes Andhra Pradesh, Bihar, Gujarat, Karnataka, Manipur, Mizoram, Nagaland, TN, UP. Trend in IMR due to HIV is similar to that of national trend in most of these states having a rising trend first for most of the years and then showing a declining trend in recent past.

CONCLUSION-High prevalence of PLHIV has been noted in above 50 age-group. Among regions of India, North-east showed highest prevalence rate while crude numbers were highest in Maharashtra, Andhra Pradesh and Karnataka. IPR and IMR is showing a declining trend in the past few years.

KEY WORDS-HIV-AIDS-PLHIV-Viremia-Prevalence-Incidence-NACO.

COVID-19 AND E –LEARNING

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In order to apprehend the influence of the unexpected outbreak of pandemic COVID-19 on higher education, the researcher has surveyed college students with the use of questionnaire approach to shed the mild on the online-learning mode of education. This extraordinary and unlucky segment of twenty first century has known as for the closure of institutes, and to cope with nervousness and panic amongst students, higher education institutes of Madhya Pradesh have resorted to online learning via online lessons to make certain that the learning manner doesn't discontinue. This lookup ambitions to look at the effectiveness, delight level, and boundaries of online training on a range of parameters in Department of Botany, Government Arts and Science College, Ratlam (MP) and Department of Botany, Government Dunger College, Bikaner (Rajasthan) Using Google forms, the survey was once carried out online. Several college students participated in this survey. A questionnaire designed by the researcher was dispatched to college students digitally, to look into the fame of implementation of e-learning. The survey suggests that on line mastering has helped college students to be in touch with

the educational life. The lookup has come to an interpretation that this pandemic has given rise to e-learning, a new normal, however E-learning has its very own boundaries and challenges that it wants to overcome to decorate the exceptional and productiveness of higher education. Finally, this document gives some recommendations with regard to overcoming the difficult obstacles & highlights the significance of online teaching in COVID-19 outbreak.

Key words-COVID-19, Education, E– learning.

The Stability of A-Quartic Functional Equations in Fuzzy Normed Spaces

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Abstract: In this paper, we establish Hyers-Ulam stability of the following functional equation

$$f(ax + a^2y + a^3z) + f(-ax + a^2y + a^3z) + f(ax - a^2y + a^3z) + f(ax + a^2y - a^3z) = 2[f(ax + a^2y) + f(a^2y + a^3z) + f(ax + a^3z) + f(ax - a^2y) + f(a^2y - a^3z) + f(a^3z - ax)] - 2[a^4(f(x) + f(-x)) + a^8(f(y) + f(-y)) + a^{12}(f(z) + f(-z)) - [a(f(x) - f(-x)) + a^2(f(y) - f(-y)) + a^3(f(z) - f(-z))]$$

introduced by C. Muthamilarasi et al. using direct and fixed-point method in Fuzzy Normed Spaces. Some results of literature are also proved, which are direct consequences of our results.

Keywords: Fuzzy normed spaces, A-Quartic functional equation, Hyers-Ulam stability, Direct and fixed-point method.

Common Fixed Point Theorems for Weak – φ Contractions in Complete Bipolar Metric Spaces

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Abstract: In this manuscript, we shall introduce weak – φ contractions and prove some common fixed point theorems for these contractions in bipolar metric spaces. We shall also derive some theorems of literature from our main results. Finally, we provide some examples in support of our main results.

Generalized Harmonic functions with varying coefficients and Applications

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Abstract: Complex-valued harmonic functions that are univalent and sense preserving in the open unit disk can be written in the form $f = h + g$, where h and g are analytic. In this paper we investigate some classes of univalent harmonic functions with varying coefficients related to Janowski functions. Introduce a new class of complex valued harmonic functions which are orientation preserving and univalent in the open unit disc and are related to uniformly convex functions. We investigate the coefficient bounds, neighborhood, and extreme points for this generalized class of functions. By using the extreme point's theory we obtain necessary and sufficient convolution conditions, coefficients estimates, distortion theorems, and integral mean inequalities for these classes of functions. The radii of star likeness and convexity for these classes are also determined.

MSC: Primary 30C45, Secondary 30C80.

Keywords: Salagean operator, subordination, extreme points, harmonic functions, Janowski functions.

A STUDY TO ASSESS THE IMPACT OF E-LEARNING ON STUDENTS OF SELECTED COLLEGE OF RATLAM DISTRICT

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ABSTRACT : The study was based on to assess the Impact of E-learning on students of selected college of Ratlam district. It also investigates whether using E-learning is beneficial for students. It is a descriptive study, Non probability convenient sampling techniques was adapted for the study. A questionnaire has been specially designed and deployed among students to assess the impact of E-learning. A sample of 55 students of selected college of Ratlam (Vikram University) was selected. The self-structured five scale Rating was used to assess the desired objectives. The study findings show that most of the students have moderate to high impact (during covid) on E-learning. There was significant association exists between impact of e- learning with demographic variables such as age, gender, place, parents education, Parents occupation, parents Monthly income, Availability of resources for E-learning. However the conclusion of E-learning is positive on students and it can adapt to improving communication and students learning experience.

Keywords: E-learning, time, technology, success/Impact measurement.

Common Fixed point theorems on fuzzy quasi-metric space

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Abstract. In this paper, we prove a common fixed point theorem on fuzzy quasi-metric space and obtain a G-complete fuzzy quasi-metric space version of our theorem. We give examples to show the fruitfulness of our results. Our results extends, generalize and fuzzify well several well known results in the existing literature.

Design and Investigation of Mathematical Model for the Vaccination and Transmission of Monkeypox Virus without lifelong Immunity

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Abstract: The monkeypox virus (MPXV) causes monkeypox (MPX), which is comparable to smallpox and cowpox. It is typically found in rural settlements in Central and West Africa, near to tropical rain forests. It is caused by the monkeypox virus, a member of the Poxviridae family of the genus Orthopoxvirus. This paper presents a set of non-linear differential equations that serves as a mathematical model for the dynamics of monkey pox transmission with control strategies of combined vaccine and treatment interventions. We developed two equilibria for the model, endemic and disease-free, via standard methods. Using the comparison theorem and the next-generation matrix, it was demonstrated that the disease-free equilibrium is both locally and globally asymptotically stable if $R_0 < 1$. By using linearization with row-reduced approach, the endemic equilibrium point only occurred when $R_0 < 1$. We present concise comments and numerical simulations to illustrate our findings. According to the research, keeping diseased people apart from the general population can help prevent the spread of disease. A sensitivity analysis of the model parameters reveals that as the treatment and vaccine control parameters are increased, the model's fundamental reproduction numbers, which were used as a threshold for detecting new infections in host populations, begin to decline.

Vitality of Mathematical Sciences in Current Scenario:

A Review

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Abstract: The vitality of Mathematical sciences is outstanding. It has consistently been making major advances in research, both in basic theory and in high impact applications. The Mathematical sciences inescapably play a superior role because they provide the fundamental language for computational simulation and data analysis. The mathematical sciences are part of almost every aspect of daily life. Computer animation , medical imaging, simply Internet search, numerical weather presentation and other computer simulations, digital communications of all types, optimization in business and military, financial risk.

Mathematical sciences work is becoming more and more integral and essential component of growing array of areas of investigation in biology, medicine, social sciences, climate, advanced materials and many more fields. The mathematical sciences also serve a natural medium through which concepts, tools and best practices can transfer from field to field.

Key words: vitality, mathematical science, analysis, simulations, optimization, prediction.

Synchronization control of a class of recurrent neural networks with time delays

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ABSTRACT: The aim of this talk is to investigate a recurrent neural network model involving distributed delays. Using the criterion of Cid as well as a relaxed standard Lipschitz condition, the exponential synchronization result is proved. In addition, the activation functions used treated here cannot be Lipschitz continuous. Hence, the classical Halanay inequality does not apply. Instead, a nonlinear form of this inequality will be utilized. Finally, a numerical example is given to show the effectiveness of the obtained results.

Include Mathematics Classification Number:34A40; 92B20; 34D06.

Include Key Words: Halanay inequality, Recurrent neural network, Synchronization.

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Bayesian Inference of parameters for Weibull distribution when observations are censored

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Abstract: The crux of presentation is to estimate Weibull parameters when the observations are censored. Maximum likelihood estimator (MLE) has been obtained for three different situations of parameters. Under different priors Bayes estimators of parameter and reliability function are proposed. These proposed estimators are compared to their corresponding MLEs on the basis of a Monte Carlo simulation study of 10000 randomly generated samples.

Generalized common fixed point theorems with fuzzy metric spaces and their application

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ABSTRACT: Some common fixed point theorems in complete fuzzy metric spaces are proved which generalize earlier results. We also establish the concept of R-weak commutativity of type (P) in fuzzy metric spaces. Some related results and illustrative examples are also discussed.

Key words: fuzzy metric space, fixed point, weakly commuting R-weakly commuting mappings

AMS subject classifications: 47H10, 54H25.

FIXED POINT THEOREMS IN R–METRIC SPACES AND FUZZYMETRIC SPACE WITH APPLICATIONS

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Abstract: The present paper is to introduce the notion of R-metric spaces with fuzzy metric space and give a real generalization of Banach fixed point theorem Banach's fixed point theorem gives a general criterion for the iteration procedure of a function to yield a fixed point. As a result, many researchers introduced several fixed point theorems for a given function under different conditions and spaces. The main objective of this study is to present and investigate two fixed point theorems related to two different contractive mappings in addition to some theoretical results concerning fuzzy metric spaces. We also explore relationship with non fuzzy or crisp metric spaces. The fixed point theorems are based on the distance function between fuzzy points.. Also, we give some conditions to construct the Brouwer fixed point. As an application, we find the existence of solution for a fractional integral equation.

Keywords: metric space ,R-metric spaces; fixed point; strong R-compact metric spaces; fractional integral equations , fuzzy metric space

Mathematics Subject Classification: 54H25, 47H10

FIXED POINT THEOREMS IN COMPLETE FUZZY METRIC SPACES

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ABSTRACT: In present paper fixed point theorems in complete fuzzy metric spaces .proved that if (X, d) is a complete metric space, This study has presented some common fixed point results for classes of contractions in partially ordered metric spaces. The results has extended and improved the results of several other well-known studies. It also provide the examples. then every weak C-contraction on X has a unique fixed point. Common Fixed Point Results for Generalized Weak C-contractions in Ordered Metric Spaces

COMMON FIXED POINT RESULT IN COMPLEX VALUED B-METRIC SPACES UNDER CONTRACTIVE CONDITION

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M.Vijaya Kumar

ABSTRACT

In this paper we prove a common fixed point theorem for two self-mappings in complex valued b-metric spaces under contractive condition. We give illustrative examples to verify the obtained result.

Keywords and phrases: Complex Valued b-Metric Space, Common Fixed Point, Contractive Type Mapping.

AMS Subject Classification (2010): 47H10, 54H25.

Common Fixed Point Theorems of Ćirić Type in Fuzzy Metric Spaces and their applications

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Bhopal

ABSTRACT

The present paper is the investigation of possibilities for improvements and generalizations contractive condition of Ćirić in the fuzzy metric spaces. Various versions of fuzzy contractive conditions by recent results, more general contractive conditions in fuzzy metric spaces are achieved and secondly, quasi-contractive type of mappings are investigated in order to obtain fixed point results with a wider class of t-norms.

Keywords: fixed point; common fixed point theorem: fuzzy metric space; t-norm; quasi-contractive mapping.

Common Coupled Fixed Point Theorem In Intuitionistic Menger Metric Space And Applications

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ABSTRACT

We create a common fixed point theorem for mappings under φ-contractive conditions on intuitionistic Menger metric spaces. As an application of our result we study the existence and uniquenes of the solution to a non-linear Fredholm integral equation. We also give an example to validate our result.

Subject Classification. Primary: 47H10, 54H25.

Key words and phrases. Intuitionistic Menger metric space, common coupled fixed points, φ-contractive condition, weak compatibility.

Heat and Mass Transfer with Free Convection MHD Flow Past a Vertical Plate Embedded in a Porous

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ABSTRACT

The present paper An analysis to investigate the combined effects of heat and mass transfer on free convection unsteady magnetohydrodynamic (MHD) flow of viscous fluid embedded in a porous medium is presented. The flow in the fluid is induced due to uniform motion of the plate. The dimensionless coupled linear partial differential equations are solved by using Laplace transform method. The solutions that have been obtained are expressed in simple forms in terms of elementary function $\exp(\cdot)$ and complementary error function $\text{erf } c(\cdot)$. They satisfy the governing equations; all imposed initial and boundary conditions and can immediately be reduced to their limiting solutions.

Key words: Hartmann number, permeability parameter, Grashof number, dimensionless time, Prandtl number, chemical reaction parameter, Schmidt number, and Soret number Nusselt number.

GENERALIZED ON FIXED POINTS IN FUZZY METRIC SPACES THROUGH WEAK COMPATIBILITY

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ABSTRACT

In this present paper we introduce the notion of compatibility and weak compatibility and we give some conditions of which six self mappings of fuzzy metric space have a unique common fixed point. Our result generalizes and extends some known results. Also we characterize the conditions for self mappings of fuzzy metric space have a unique common fixed point.

AMS Subject Classification: 47H10, 54H25

Key Words: fuzzy metric space, compatible mappings, weakly compatible mappings, common fixed point.

MATHEMATICS IN SOCIOLOGY AND APPLICATION

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Abstract

In view of the fact that mathematical sociology was firmly established in the 1960s, it has grown tremendously. At present it has an impressive scope and deals with topical problems of social structure with social change. Presuppositions, current developments, challenges and prospects for mathematical sociology are described.

In synthesis between process, structure, and action. In combination with an increased attention to social mechanisms and the problems of causality and temporality, this synthesis can add to its relevance for sociology in general. advances and major sociological research streams in contemporary sociology that involve the application of mathematics, logic, and computer modelling or the sociology of mathematics is an interdisciplinary field .of research concerned both with the use of mathematics with in the relationships that exist between   maths   and   society.

Relationships that exist between maths and society. Mathematics has always been used in various disciplines to solve problems. Sociology is no exception to it . Game Theory and little known Social Network Analysis which has grown rapidly, sociologists have been trying to highlight the significance and application of Mathematics in explaining Sociological theories. With the advancement in society, individuals are related to each other in very complex manner. Thus task of a Sociologist to analyze a domain comprised of particular actors of the society is very difficult.

A Social Scientist needs innovative sociological models and tools to explore and analyze situations in order to reach to a correct conclusion. Since inception of Modern Mathematical Sociology it has been repeatedly highlighted that mathematical concepts of Matrix, Mapping, Probability can be highly useful in

mathematical and statistical modelling in a sociological theory. However no mere presentation or use of fanciful equations or mathematics can make a wrong theory right.

GENERALISED Harmonic functions with varying coefficients AND APPLICATIONS

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Abstract

Complex-valued harmonic functions that are univalent and sense preserving in the open unit disk can be written in the form f = h + g, where h and g are analytic. In this paper we investigate some classes of univalent harmonic functions with varying coefficients related to Janowski functions. introduce a new class of complex valued harmonic functions which are orientation preserving and univalent in the open unit disc and are related to uniformly convex functions. We investigate the coefficient bounds, neighborhood, and extreme points for this generalized class of functions. By using the extreme point's theory we obtain necessary and sufficient convolution conditions, coefficients estimates, distortion theorems, and integral mean inequalities for these classes of functions. The radii of star likeness and convexity for these classes are also determined.

Mathematics for Scenarios of Biodiversity and Ecosystem with their application

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Abstract: In present paper on Mathematics for Scenarios of biodiversity Ecosystem with applications . Mathematical modelling can serve as a rational and powerful tool in the management of complex ecosystems. However, ecosystem models be drastic simplifications of the real world. The current paper provides generic modeling methods and tools to lecture to such challenges. The paper argues that the framework of controlled dynamic systems under uncertainty together with eco viability metrics are especially well suited. As a rule they are based on a rather incomplete and scattered knowledge of the system. Furthermore, ecological systems and characterized by a high degree of complexity, spatial and functional heterogeneity, nonlinearity, complex, stochastic element. if management is to be based on predictions from mathematical models - and it has to be based on some kind of '"model"" in at least a broad sense - we need an estimate of prediction accuracy in terms of the management variables and constraints. One possible approach to model uncertainty is a probabilistic interpretation of model predictions, Balancing biodiversity conservation with food security and the preservation of a broader set of ecosystem services is among the greatest challenges of the century. The creation of the International Panel for Biodiversity and Ecosystem Services (IPBES), at the interface between decision support and scientific knowledge, is clearly in line with this ecological-economic perspective. IPBES particularly puts forward the development of model-based scenarios making sense economically and ecologically and promoting sustainability. Such a modeling structure indeed makes it possible to simultaneously account for complex dynamics, indirect or indirect drivers, uncertainties along with multiple

sustainability objectives. These universal ideas are exemplify with scenarios relating to two applied fields: (i) fisheries and marine biodiversity and (ii) land-use and avifauna mathematical techniques for distinguishing among alternative ecological theories and hypotheses. Examples from a wide array of research areas in population biology and community ecology highlight the importance of fostering synergistic ties across disciplines for current and future research and application.

Common Fixed point theorems on intuitionistic fuzzy quasi-metric space

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Abstract. In this paper, we prove a fixed point theorem on intuitionistic fuzzy quasi-metric space and obtain a G-complete intuitionistic fuzzy quasi-metric version of our theorem. We also give examples to validate our results. Our result extends, generalize and intuitionistically fuzzify several known results.

Symmetric Key Generation Based on Pythagorean Triples

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ABSTRACT: Key generation and Secure is critical to the security of a Cryptosystem. In fact, key generation and key exchange is the most challenging part of cryptography. In this paper, a scheme for symmetric key generation based on Pythagorean triple has been presented. The proposed scheme incorporates a Key Distribution center (KDC) for user authentication and secure exchange of secret information to generate keys. The KDC operation involves a request from a user for initiation. The KDC authenticates authenticate and secure exchange of secret information to generate keys. The KDC authenticates the initiator. If the authentication is successful, KDC generates and sends an encrypted timestamp to both the initiator and responder.

The proposed system is based on a novel mechanism to determine Pythagorean triples to generate keys. The formula uses factors of x to generate y and z such that x , y , z satisfy the Pythagorean theorem $x^2 + y^2 = z^2$.

The following notation has been used to Pythagorean triple calculation

x- input to calculate Pythagorean triple

p_1 - First prime factor of x

p_2 - Second Prime factor of x

Y and z – Key Pair

Suppose, If x is odd then $y = \dfrac{|x^2 - p_1^2|}{2p_1}$ and $z = \dfrac{|x^2 + p_1^2|}{2p_1}$ the final key is computed by

XORing y and z. i.e. $p = y \oplus z$.

Similarly, generate another Key pair of (y,z) with using of second prime factor p_2 .

In this way we can generate Symmetric key based on Pythagorean Triples.

Application of Genetic Algorithms to Inventory Model with Freshness dependent Segmentation, Discounted Price and Shortages

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Abstract: Consideration of freshness plays an important role in selling of the fresh produce (dairy, fruits, vegetables, meat etc.) and has been considered only recently in inventory literature. As different levels of freshness in such products fetchdifferent selling prices, quality dependent segmentation of the items becomes imperative. In this paper, an inventory model is studied, in whichreceived stock has random proportion of fresh items segmented in accordance with freshness condition of the items, where the freshness condition declines with time. Demand is thus a function of multiple factors like time, price, discount, freshness condition etc. Genetic algorithm(GA) using R-project is applied to the model in order to find near optimal combination of selling price, discount and run length.

Keywords: inventory model, segmentation, fresh produce, genetic algorithm.

Sums of Bivariate Fibonacci and Bivariate Lucas Polynomials

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Abstract: In this paper, we present sums of Bivariate Fibonacci polynomials and Bivariate Lucas polynomials. We have used their Binet's formula and Generating function to derive the identities.

Keywords: Bivariate Fibonacci polynomials, Bivariate Lucas polynomials, Binet's formula, Generating function.

Artificial Intelligence and Computational Methods: Optimization of Complex Systems

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Abstract: This paper examines the potential of Artificial Intelligence (AI) and Computational Methods for optimizing computers. The focus is on the power of AI and Computational Methods to enable computers to function more efficiently and effectively. The research covers the latest developments in the use of AI and Computational Methods for optimizing computer performance, including the use of Machine Learning, Deep Learning, Natural Language Processing, and Evolvable Hardware. The paper also explores the various challenges and opportunities associated with AI and Computational Methods in the context of optimizing computer performance, such as the need for more powerful hardware, the complexity of algorithms, and the impact of AI on security. Finally, the paper provides an overview of the current research, applications, and future prospects of AI and Computational Methods for optimizing computer performance.

Artificial Intelligence and Computational Methods are used to optimize complex systems. These methods can be used to identify optimal solutions to complex problems, reduce costs and improve efficiency, and automate decision-making processes. AI-driven optimization techniques can be used to reduce the complexity of large-scale systems, improve the accuracy of predictive models, and identify the most cost-effective solutions to problems. AI and computational methods can also be used to improve the accuracy of forecasting models and generate more accurate predictions about the future. By leveraging the power of AI and computational methods, organizations can optimize their complex systems and make better decisions.

It looks at how AI and Computational Methods can be used to improve a computer's processing speed, memory, and storage capabilities. Finally, the paper looks at how AI and Computational Methods can be integrated into existing systems to create a more efficient and powerful computer. With the increasing complexity of computing tasks and the ever-evolving technology, the use of AI and Computational Methods in optimization is becoming more popular.

It analyses the current state of AI and computational methods as they relate to computer optimization, and discusses their potential application in the future. The paper concludes by offering ideas for future research and development in the area of artificial intelligence and computational methods for computer optimization.

ई-लर्निंग द्वारा शिक्षकों का व्यक्तित्व विकास

डॉ विजया कुशवाह, प्रो प्रियंका एनस्लेम, प्रो दीनू पाटीदार
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सारांश (Abstract)-किसी भी व्यक्ति के व्यक्तित्व विकास में शिक्षा की भूमिका महत्वपूर्ण है । वर्तमान में शिक्षा के क्षेत्र में कंप्यूटर , इंटरनेट, नेटवर्किंग प्रणाली , ई स्कूल प्रणाली, ई लर्निंग प्रणाली, आभासी कक्षा (Varctual classroom), आदि का प्रयोग तीव्रता से बढ़ता जा रहा है। इस प्रकार शिक्षा में तकनीकी के उपयोग का तीव्र गति से परिवर्तन हुआ है ।आज हमारा देश तकनीकी हब के रूप में उभरकर शिक्षण और अधिगम को सूचना तकनीकी के माध्यम से एक मजबूत शिक्षा तंत्र के रूप में बदल कर उभर रहा है।

ई लर्निंग एक प्रकार की इलेक्ट्रॉनिक तकनीकी द्वारा प्रदत और सुगम्य में बनाए गए अधिगम के अवसर हैं ,जो अधिगम के तीनों संगठको जिसमें विषय वस्तु ,अधिगम की विधियां और शिक्षण की विधियां सम्मिलित है, के रूप में कक्षा कक्ष में पूर्णता भिन्न है। इस विधि से शिक्षण द्वारा शिक्षकों का व्यक्तित्व विकसित होता है तथा शिक्षक ई लर्निंग की सहायता से बालको के संपूर्ण विकास में सहायक हो रहे हैं। बस आवश्यकता है वर्तमान परिदृश्य में शिक्षकों को ई लर्निंग की महत्वता को समझने की और उसे सीखने की।

Bayes Prediction for Pareto distribution when observations are progressively censored

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Abstract: This paper deals with the two sample Bayesian prediction problem for Pareto distribution when observations are progressive type II censored. Bayesian predictive distribution and corresponding prediction limits are obtained for a general kth ordered future observation. Performances of the proposed prediction limits have been studied for the smallest ordered future observation on the basis of Monte Carlo simulation study.

Mathematical modeling of dominant Retailer's hybrid payment policywith Endogenous and Exogenous optionalDiscounted Partial Advance and Trade-credit withLinear Time varying Demand

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Abstract

The post-recession pre covid-19 period witnessed unilateral extensions of trade credit periods by giant manufacturers when purchasing raw materials from small suppliers. This resulted in financial crunch for the small suppliers leading to their inability to arrange finances for manufacturing their products. To overcome this situation, the supplier requires co-operation from the buyer for manufacturing of raw materials etc., in terms of partial advance payment. We develop an inventory model for dominant retailer with discounted partial advance payment to supplier and interest free delay period permitted by the supplier. For a linear time dependent demand function, we maximize retailer's net profit rate through optimal choice of payment policy and the retailer's replenishment. We consider two situations, with discount as(i) exogenous (ii) endogenous for the retailer in an EOQ framework. Model developments, analysis, derivations of conditions for optimal solution are provided. Numerical results are presented to gain insights of the real world problems modelled.

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