7th International IFS and Contemporary Mathematics Conference

May, 25-29, 2021 Turkey

CONFERENCE ABSTRACT BOOK

EDITOR
ASSOC. PROF. DR. Gökhan ÇUVALCIOĞLU

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PREFACE

We are very pleased to introduce the abstracts of the 7th International IFS and Contemporary Mathematics Conference (IFSCOM2021).
As previous conferences, the theme was the link between the Mathematics by many valued logics and its applications.

In this context, there is a need to discuss the relationships and interactions between many valued logics and contemporary mathematics.

Finally,in the previous conference, it made suceessful activities to communicate with scientists working in similar fields and relations between the different disciplines.

This conference has papers in different areas; multi-valued logic, geometry, algebra, applied mathematics, theory of fuzzy sets, intuitionistic fuzzy set theory, mathematical physics, mathematics applications, etc.

Thank you to paticipants scientists offering the most significant contribution to this conference.

Thank you to Scientific Committee Members, Referee Committee Members, Local Committee Members and MAJOR TEAM supporting this conference.

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CONTENTS

TRAVELLING WAVE SOLUTIONS OF THE FOURTH-ORDER STRONGLY NONLINEAR WAVE EQUATION

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ABSTRACT

This study considers the fourth-order nonlinear wave equation,

$$u_{tt} + \alpha(u^2)_{xx} + \beta(u^2)_{xxxx} + \delta u + \gamma u^2 = 0,$$

which is called the nonlinear Bretherton equation [1, 2], to investigate travelling wave solutions. Using the analytical tools [3], we discuss the global existence and blow-up phenomena of the solutions for the proposed equation with the suitable coefficients. Although there have been various analytical studies on the semilinear versions of the proposed equation [4, 5, 6], this study gives the first attempt for the strongly nonlinear version.

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INTEGRODIFFERENCE EQUATIONS IN MATHEMATICAL BIOLOGY: GROWTH-DISPERSAL AND PREDATOR-PREY MODELS

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ABSTRACT

Integrodifference equations are discrete-time models that have many properties of continuous-time reaction-diffusion equations. These equations are also often used in mathematical biology. In this work, we talk about discrete-time growth-dispersal and predator-prey models [1, 2]. We emphasize the models which can be represented as integrodifference equations and we show that the stability situtations of them with the some graphs.

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INTEGRABILITY CONDITIONS OF CONFORMAL
QUASI-HEMI-SLANT SUBMERSIONS

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ABSTRACT

In this paper we define conformal quasi-hemi-slant submersions from almost Hermitian manifolds onto Riemannian manifolds and present an example which forming the structure of this type map. Lastly, we present integrability conditions of distributions.

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APPROXIMATION TO FUNCTIONS IN WEIGHTED LIPSCHITZ CLASS OF THE ORLICZ SPACE $L_M(\mathbb{T},\omega)$

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ABSTRACT

In a recent paper, the author has studied approximation to functions in weighted Lipschitz class by using the t_n method, Woronoi-Nörlund mean and Riesz mean in weighted Orlicz space and determined as $O(n^{-\alpha})$ the degree of approach [1]. Inspired by this study, we examine the similar problem for methods that generalize with respect to λ_n the results in [1] according to the technique given in [2] where (λ_n) is a strictly increasing sequence of positive integers, and we obtaine the degree of approach as $O(\lambda_n^{-\alpha})$ depending on the methods.

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B-CONVEXITY AND B-CONCAVITY PRESERVING PROPERTY OF TWO-DIMENSIONAL BERNSTEIN OPERATORS

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ABSTRACT

In this study, we present some properties regarding B-convex and B-concave functions. Also, it has been determined whether the convexity properties of these functions are preserved by Bernstein operators of two variables. Consequently, we give some examples of which Bernstein polynomials of two variables do not preserve convexity properties of these functions. In addition, of these convexities, results are given regarding conditions it will be preserved.

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RANK OF $N_r(\mathcal{C}_n)$

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ABSTRACT

The Catalan monoid $\mathcal{C}_n$ is the semigroup of all order-preserving and decreasing transformations on a finite chain $X = \{1, 2, \ldots, n\}$. Let $N(\mathcal{C}_n)$ be the subsemigroup of all nilpotent elements of $\mathcal{C}_n$. For $1 \leq r \leq n-1$, we consider the set

$$N_r(\mathcal{C}_n) = \{\alpha \in N(C_n) : \alpha \text{ is an } m\text{-potent for any } 1 \leq m \leq r\}.$$

In this talk, we show that $N_r(\mathcal{C}_n)$ is an ideal of $\mathcal{C}_n$, and so of $N(\mathcal{C}_n)$. Then, we find the minimum generating set and a lower bound for the rank of $N_r(\mathcal{C}_n)$.

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OPTIMAL CONTROL FOR AN INFECTIOUS DISEASE MODEL WITH IMPERFECT TESTING

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ABSTRACT

In this work, we construct an optimal control problem (OCP) based on a SIR model [1] where dynamics of susceptible, infected and recovered individuals are modeled as a system of ordinary differential equations under the effect of imperfect testing. As different from the classical SIR models, Villela's model includes two more compartments where the compartment S_m describes the number of tested susceptible individuals that are identified incorrectly as infected and the compartment I_m denotes the number of infected individuals whose treatment are started after testing. To construct the required OCP, the basic reproduction number R_0 is obtained and its sensitivity with respect to the model parameters is discussed. We find out that contact rate and testing rate are critical parameters to decrease the number infected individuals. Therefore, we apply some intervention strategies to optimize the contact rate so that spread of the disease can be controlled [2]. Moreover, we determine the optimal testing rate. Numerical results show the usefulness of the optimization strategies and we find out that quarantine and isolation are important interventions in case of limited testing. In addition, the spread of the disease can be successfully controlled together with optimal testing strategy.

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C-PURE SUBMODULES AND C-FLAT MODULES

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ABSTRACT

Let R be a ring. A right R-module A is said to be C-flat if the kernel of any epimorphism $B \to A$ is C-pure in B, i.e. the induced map $\mathrm{Hom}(C, B) \to \mathrm{Hom}(C, A)$ is surjective for any cyclic right R-module C. Projective modules are C-flat and C-flat modules are weakly-flat and neat-flat. In this article, it is discussed the connections between C-flat, weakly-flat and neat-flat modules. It is shown that C-flat modules coincide with singly-projective modules over arbitrary rings. Next, several characterizations of certain classes of rings and modules via C-purity are considered. We prove that, every C-flat module is injective if and only if R is a QF ring. Moreover, we show that R is a CF ring if and only if every singly injective right R-module is C-flat.

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ON SOME INTEGRAL INEQUALITY FOR S-CONVEX FUNCTIONS IN THE FOURTH SENSE

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ABSTRACT

This inequality asserts that for a convex function defined on the interval $[a, b]$,

$$f\left(\frac{a+b}{2}\right) \leq \frac{1}{b-a}\int\limits_a^b f(x)dx \leq \frac{f(a)+f(b)}{2}.$$

This inequality attracts special interests of many researchers. They presented various refinements, extensions, generalizations for different function types see [1, 2, 3, 4, 7, 8, 6] and the references therein. The s-convex functions in the fourth sense mentioned in this study, are a class that has recently entered the literature. Let U be a convex set, $f : U \to \mathbb{R}$ is said to be s-convex function in the fourth sense if the inequality holds,

$$f(\lambda x + \mu y) \leq \lambda^{\frac{1}{s}} f(x) + \mu^{\frac{1}{s}} f(y)$$

for all $x, y \in U$ and all $\lambda, \mu \geq 0$ with $\lambda + \mu = 1$, and for some fixed $s \in (0, 1]$ [5].

In this article, the Hermite-Hadamard inequality is given for s-convex functions in the fourth sense. For s-convex function in the fourth sense, two generator functions are defined by integrable function which are s-convex function in the fourth sense. Some properties of these generator functions are mentioned.

Finally, some applications have been made through the Hermite-Hadamard inequality, so new integral inequalities are obtained.

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ASSYMPTOTIC PROPERTIES OF STURM LIOUVILLE PROBLEM WITH RETARDED ARGUMENT THAT CONTAINS PARAMETER IN THE BOUNDARY

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ABSTRACT

Sturm Liouville equation with retarded argument that contains parameter in the boundary will be considered. Especially below equation will be discussed.

$$(1) \qquad y''(x) + \lambda^2 y(x) + M(x)y(x - \Delta(x)) = 0$$

$$(2) \qquad \cos \alpha y(0) + \sin \alpha y'(0) = 0$$

$$(3) \qquad \cos \beta y(\pi) + \lambda \sin \beta y'(\pi) = 0$$

$$(4) \qquad y(x - \Delta(x)) = y(0)\phi(x - \Delta(x)) \qquad x - \Delta(x) < 0$$

here $M(x)$ and $\Delta(x) \geq 0$ functions are continuous in $[0, \pi]$ interval, λ is a real parameter, α and β are arbitrary real numbers, $\Phi(0)$ function is a continuous initial function that satisfies $\Phi(0) = 1$. In this thesis, for different values of α and β numbers eigenvalues and eigenfunctions of $(1 - 4)$ will be obtained.

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GENERAL DECAY OF SOLUTIONS FOR A HEAT EQUATION

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ABSTRACT

In this paper, we considered nonlinear heat equation with Kirchhoff-type, viscoelastic term and nonlinear source term. We discussed the general decay of the solution.

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LOWER BOUNDS OF SOLUTIONS FOR A SYSTEM OF HYPERBOLIC EQUATION

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ABSTRACT

In this work, we obtained the lower bounds for the blow up time occurs for a system of hyperbolic type equation with nonlinear source and degenerate damping.

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EXISTENCE OF SOLUTIONS FOR A REACTION DIFFUSION EQUATION WITH MULTIPLE NONLINEARITIES

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ABSTRACT

In this work, we analysed heat equation with multiple nonlinearities in bounded domain. We showed the local existence and global existence of weak solutions by using the Galerkin approximation method.

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GLOBAL NONEXISTENCE OF SOLUTIONS FOR A SYSTEM OF VISCOELASTIC PLATE EQUATIONS

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ABSTRACT

We study a system of viscoelastic plate equations with degenerate damping and source terms under Dirichlet boundary condition. We obtain the blow up of solutions.

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GROWTH OF SOLUTIONS FOR A SYSTEM OF KIRCHHOFF-TYPE EQUATIONS WITH DEGENERATE DAMPING TERMS

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ABSTRACT

In this study, we considered a coupled Kirchhoff-type equations with degenerate damping terms. We prove exponential growth of solutions.

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GLOBAL EXISTENCE OF SOLUTIONS TO EQUATION WITH DEGENERATE DAMPING

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ABSTRACT

This study deal with the strongly damped equation with degenerate damping has the initial-boundary value. We establish global existence of weak solution by potential well theory.

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BIVARIATE MAX-PRODUCT BERNSTEIN CHLODOWSKY OPERATORS

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ABSTRACT

In the approximation theory, polynomials are particularly positive linear operators. Nonlinear positive operators by means of maximum and product were introduced by B. Bede. In this study, nonlinear maximum product type Bivariate Bernstein Chlodowsky operators are defined and approximation properties are investigated with the help new definitions.

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SOME RESULTS ON THE WHITEHEAD ASPHERICITY PROBLEM

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ABSTRACT

Given a group presentation $\mathcal{P} = \mathcal{GP}(\mathbf{x}, \mathbf{r})$, we consider the free $FG(\mathbf{x})$-crossed module $(\mathcal{G}(\Upsilon), \tilde{\theta}, FG(\mathbf{x}))$ on the set $Y^{\pm 1}$ of symbols $(^u r)^\varepsilon$ ($\varepsilon = \pm 1$) with $r \in \mathbf{r}$. In terms of $\mathcal{G}(\Upsilon)$ we prove that if $d = (a_1, ..., a_n)$ is an identity Y-sequence over $\mathcal{P}$, then d is Peiffer equivalent to the empty sequence if and only if, the image of d in $\mathcal{G}(\Upsilon)$ belongs to the subgroup $\hat{\mathfrak{U}}$ of $\mathcal{G}(\Upsilon)$ generated by the images of aa^{-1} with $a \in Y \cup Y^{-1}$. We use this to prove a necessary and sufficient condition under which a subpresentation of an aspherical group presentation is aspherical. We also consider the pair of presentations $\mathcal{P} = \mathcal{GP}(\mathbf{x} \cup z, \mathbf{r}_1 \cup \{r_0\})$ and $\mathcal{P}_1 = \mathcal{GP}(\mathbf{x}, \mathbf{r}_1)$ where $\mathcal{P}$ represents the trivial group and $r_0 \notin \mathbf{r}_1$. If we let N_0 be the normal closure of r_0 in the free group F of $\mathbf{x}$, then we prove that if the presentation $\mathcal{P} = \mathcal{GP}(\mathbf{x} \cup z, \mathbf{r}_1 \cup \{r_0\})$ is aspherical, then the structure map $\tilde{\vartheta}_1$ of the free crossed module $(\tilde{\mathcal{C}}_1, F/N_0, \tilde{\vartheta}_1)$ on $\mathbf{r}_1$ over N/N_0 is injective.

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A WAGNER-PRESTON REPRESENTATION THEOREM FOR CLIFFORD SEMIGROUPS

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ABSTRACT

We prove in this paper an analogue of the Wagner-Preston theorem for Clifford semigroups. The role of the symmetric inverse semigroup I_X on a set X is played in our theorem by what we define here as the symmetric Clifford semigroup $\mathscr{C}(S)$ on the semilattice of ideals of a semigroup $(S, \cdot)$, which consists of all partial bijections of the underlying set S with domain and codomain an ideal of $(S, \cdot)$ and that preserve all ideals of $(S, \cdot)$ which include in the domain. Our theorem then states that every Clifford semigroup $(S, \cdot)$ embeds into its symmetric Clifford semigroup $\mathscr{C}(S)$.

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A NOTE ON AFFINE TRANSLATION SURFACES

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ABSTRACT

A translation surface is a surface that forms when one curve $\beta(s)$ is translated over another curve $\gamma(t)$. Therefore, it is defined as the sum of the two generating curves $\beta(s)$ and $\gamma(t)$ [1]. An affine translation surface has then been described by generalizing the translation surface. According to this, the affine translation surface in Euclidean 3$-$space E^3 is defined as a parameter surface $r(s,t)$ such that

$$r(s,t) = (s, t, f(s) + g(t + as))$$

where a is a constant and $f(s), g(t + as)$ are any differentiable functions [2, 3].

In this study, we deal with the second Gaussian curvature and the second mean curvature of affine translation surfaces. Performing patch computations, we calculate the second Gaussian curvature and the second mean curvature. For $II-$flat and $II-$minimal affine surfaces, we have obtained some results.

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NEW INTEGRAL INEQUALITIES FOR s-CONVEX FUNCTIONS IN THE FOURTH SENSE.

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ABSTRACT

In this article, some integral inequalities have been obtained for a new class, s-convex functions in the fourth sense, which can be considered as a continuation of s-convex functions classes. For the new inequalities obtained, applications including special means are given. Also, a new inequality has been obtained for the Digamma function.

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WEAKLY LOCALLY ARTINIAN SUPPLEMENTED MODULES

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ABSTRACT

In this study, by using the concept of locally artinian supplemented modules, we have obtained that weakly locally artinian supplemented modules as a proper generalization of these modules in module theory. Our results generalize and extend various comparable results in the existing literature. We have proved that a notion of weakly locally artinian supplemented modules inherited by factor modules, finite sums and small covers. We have obtained that weakly locally artinian supplemented modules with small radical coincide with weakly (radical) supplemented modules which have locally artinian radical. Also, we have shown that if N and $\frac{M}{N}$ are weakly locally artinian supplemented for some submodule $N \subseteq M$ which has a weak locally artinian supplement in M then M is weakly locally artinian supplemented

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ON GENERALIZATIONS OF LOCALLY ARTINIAN SUPPLEMENTED MODULES

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ABSTRACT

The aim of this paper is to investigate generalizations of locally artinian supplemented modules in module theory, namely locally artinian radical supplemented modules and strongly locally artinian radical supplemented modules. We have obtained elementary features for them. Also, we have characterized strongly locally artinian radical supplemented modules by left perfect rings. Finally, we have proved that the reduced part of a strongly locally artinian radical supplemented R-module has the same property over a Dedekind domain R.

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SOME TRIPLE BINOMIAL SUMS WITH LUCAS NUMBERS

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ABSTRACT

In this study, we will present some new interesting sums with binomial coefficients. We will consider the triple binomial sums including Lucas numbers rather than Fibonacci numbers. Moreover, since the binomial coefficients are specially selected in the sums, the sums have nice multiplication forms.

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NEIMARK-SACKER BIFURCATION AND STABILITY OF DISCRETE-TIME PREY-PREDATOR MODEL WITH ALLEE EFFECT

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ABSTRACT

The dynamical behavior of the prey-predator model in ecology has been the area of study for many researchers and hence a substantial contribution to the growth of the population models have been provided. In case of populations that have overlapping generations and the birth processes occuring continuously, the ordinary differential equations are used for modeling of predator-prey interaction. Many species, such as monocarpic plants, and semelparous animals have discrete non overlapping generations, and their births occur in regular breeding seasons. their interactions are characterized by discrete time equations.

In this study investigates the dynamical behaviors of a two-species discrete predator-prey system with Allee effect.The existence of fixed points, stability of co-existence fixed points and Neimark–Sacker bifurcation are analyzed for the discrete-time domain. The time graphs, phase portraits, and bifurcation diagrams are obtained for different parameters of the model. Numerical simulations and graphics show that the discrete model exhibits rich dynamics, which also present that the system is a chaotic and complex one.

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FLIP BIFURCATION AND STABILITY ANALYSIS IN A TWO-DIMENSIONAL DISCRETE-TIME PREY-PREDATOR MODEL

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ABSTRACT

Prey-predator interactions are one of the most important among species interact in ecological communities. Mathematical models are needed to study the interactions of these types. These interactions are modeled with the help of continuous or discrete time equations. Many species have no overlap between generations, and their population evolves in discrete-time steps. These population models are expressed by difference equations. Moreover, discrete-time models have richer dynamics than continuous models. Therefore, the researchers' interest has recently increased to discrete- time systems.

In this study, the qualitative behavior of discrete-time population model related to Allee effect is investigated. The discrete-time model is obtained by applying the forward Euler scheme. The parametric conditions for local stability of the coexistence fixed point are obtained. Moreover, we proved the existence and direction for Flip bifurcation with the help bifurcation theory. Also, numerical simulations are presented to support the obtained theoretical results.

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ASYMPTOTIC BEHAVIOUR OF SOLUTIONS FOR A HIGHER-ORDER PARABOLIC EQUATION WITH LOGARITHMIC NONLINEARITY

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ABSTRACT

In this work, we investigate the inital boundary-value problem for a higher-order parabolic equation with logarithmic nonlinearity. Firstly, we get the existence of global weak solution, by the potential wells method. Later, we investigate the decay of solutions.

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BLOW-UP AT INFINITY OF WEAK SOLUTIONS FOR A HIGHER-ORDER PARABOLIC EQUATION WITH LOGARITHMIC NONLINEARITY

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ABSTRACT

In this work, we investigate the inital-boundary value problem for a higher-order parabolic equation with logarithmic nonlinearity. We get blow-up at infinity of weak solutions.

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INDEPENDENCE VERSUS UNCORRELATEDNESS: FROM EARLY STUDIES TO CURRENT RESEARCHES

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ABSTRACT

The paper presents a review of the results related to the interconnectedness between the two fundamental notions of probability theory and mathematical statistics, namely, the independence and uncorrelatedness of random variables. Both classical results and recent researches will be discussed. Two open problems are formulated.

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ON FUNCTION SPACES CHARACTERIZED BY THE WIGNER TRANSFORM

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ABSTRACT

Let ω_i be weight functions on $\mathbb{R}$, (i=1,2,3,4). In this work, we define $CW_{\omega_1,\omega_2,\omega_3,\omega_4}^{p,q,r,s,\tau}(\mathbb{R})$ to be vector space of $(f,g) \in \left(L_{\omega_1}^p \times L_{\omega_2}^q\right)(\mathbb{R})$ such that the $\tau-$Wigner transforms $W_\tau(f,.)$ and $W_\tau(.,g)$ belong to $L_{\omega_3}^r\left(\mathbb{R}^2\right)$ and $L_{\omega_4}^s\left(\mathbb{R}^2\right)$ respectively for $1 \le p,q,r,s < \infty$, $\tau \in (0,1)$. We endow this space with a sum norm and prove that $CW_{\omega_1,\omega_2,\omega_3,\omega_4}^{p,q,r,s,\tau}(\mathbb{R})$ is a Banach space. We also show that $CW_{\omega_1,\omega_2,\omega_3,\omega_4}^{p,q,r,s,\tau}(\mathbb{R})$ becomes an essential Banach module over $\left(L_{\omega_1}^1 \times L_{\omega_2}^1\right)(\mathbb{R})$. We then consider approximate identities.

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ON THE N-FOLD PRODUCT OF FRACTIONAL OPERATORS

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ABSTRACT

In this work, using the n-fold product of fractional integral and maximal operators, we prove that the boundedness of these fractional operators and their corresponding multilinear fractional operators under some conditions on weighted variable exponent Lorentz spaces.

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FOURIER TRANSFORMS OF SOME ORTHOGONAL POLYNOMIALS IN TWO-VARIABLES

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ABSTRACT

In this paper some new bivariate orthogonal functions are investigated by using Fourier transforms of bivariate orthogonal polynomials. Orthogonality relations are obtained with the help of the Parseval identity. Recurrence relations are also given for new families of orthogonal functions.

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A TECHNIQUE FOR THE SOLUTION OF FREDHOLM INTEGRAL EQUATIONS

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ABSTRACT

Nonlinear integral equations appear in various mathematical problems modeling nonlinear event. It is well known that integral and differential equations are associated with a wide range of applied mathematics and physical problems, such as mechanics, electricity, capacitor theory, bioengineering, control theory or electrochemistry. Therefore the theory of integral equations has been quickly developing in recent decades with the help of various issue of functional analysis, fixed point theory and topology.

Recently, many researchers have been studying solutions of different kinds of nonlinear integral equations defined on a bounded interval or on an unbounded domain, for example nonlinear Volterra integral equations, nonlinear Fredholm integral equations, Hammerstain integral equations, Urysohn integral equations and nonlinear integral equations of fractional order.

In this presentation, using the technique associated with the classical Schauder fixed point theorem we show that the existence of solutions of a class of quadratic integral equation of Fredholm type in Hölder spaces. Our analysis relies on a sufficient condition for the relative compactness in Hölder spaces and the classical Schauder fixed point theorem.

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A SURVEY ON TOPOLOGICAL STRUCTURE OF SOME SEQUENCE SPACES

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ABSTRACT

In this paper, we give a survey of recent results in the theory of FK spaces between distinguished subspaces. We shall deal with sequence spaces that are closely related to various concepts of summability. Also, we study their topological structures and determine their some duals. Further, we give necessary and sufficient conditions about relationship between them.

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A NEW CONSTRUCTION OF LINEAR POSITIVE OPERATORS BASED ON BETA FUNCTION

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ABSTRACT

The subject of approximation by linear positive operators is one of the rooted area in approximation theory. The development of linear positive operators has a long history. One of the most celebrated approach was the Weierstrass theorem [10] that is concerned with the approximation of continuous functions by polynomials on a finite interval. Bernstein polynomials [4] serve as a fundamental operators in proving the Weierstrass theorem in the simplest form. After the discovery of Bernstein operators, many new operators have also appeared with different points of view [1, 2, 3, 5, 6, 7].

The main subject of this talk is to present new class of linear positive operators by combining Schurer operators [9] and a transformation formula for the Pochhammer symbol [8]. We focus on the approximation properties of the operators such as uniform convergence and the rate of the convergence and we mention the rate of pointwise convergence by means of the Voronovskaja type theorem. In addition, we give some examples by illustrative graphics.

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USING INTUITIONISTIC FUZZY C-MEANS CLUSTERING ALGORITHMS TO MODEL COVID-19 CASES IN THE HIGH RISKS COUNTRIES

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ABSTRACT

Clustering analysis is a statistical method that allows you to describe the common characteristics of the units, collecting the units examined in a study according to similarities. Fuzzy clustering analysis helps to cope with the real numbers' uncertainty to reveal appropriate clustering models for daily life experience. Fuzzy C-means (FCM) clustering is one of the most common blurred clustering algorithms. Nevertheless, the main disadvantage of this algorithm is it's sensitivity to noise and contrary values. The intuitionistic fuzzy C-means (IFCM) clustering is a suitable tool for coping with flawlessly defined facts, data, and non-precision information. To apply the IFCM algorithm on a real-valued dataset, the data points are transformed to an intuitionistic fuzzy set using a highly popular technique known as Yager's generating function. The study aims to examine the results of the COVID-19 pandemic that has become one of the most important issues of the world agenda since the final months of 2019. In this study, the IFCM clustering algorithm is used to understand the dynamic behavior of the COVID-19 based on the real data for some countries around the world and Turkey. In the analysis of the data is realized with MATLAB and R programs.

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THE SPHERICAL IMAGES OF A CURVE ACCORDING TO TYPE-2 BISHOP FRAME IN WEYL SPACE

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ABSTRACT

In this work, we obtained the spherical images of a curve according to type-2 Bishop frame in three dimensional Weyl space. We investigated the relations among type-2 Bishop and Frenet-Serret invariants of these spherical images. Besides, we expressed the conditions to be general helix, slant helix and spherical curve of the spherical images. For this reason, we discussed the equivalents of the above concepts in Weyl space. We have seen that, all of these concepts are expressed depending on the first and second curvatures of a curve and hence Bishop curvatures. Also, we gave the definition of circle and the condition to be circle of a curve in Weyl space, using prolonged covariant derivative. Finally, the condition to be the Chebyshev net of the first kind for the net which is generated by Frenet-Serret vector fields of the spherical images of C was obtained.

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SOME CLASSIFICATIONS OF BICONSERVATIVE SUBMANIFOLDS IN MINKOWSKI 5-SPACE

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ABSTRACT

Biconservative submanifolds are defined as conservative stress–energy tensor with respect to the bienergy, which is a natural generalization of biharmonic submanifolds. In this paper, we study biconservative Riemannian submanifolds with have parallel normalized mean curvature vector field in Minkowski 5-space. We obtain shape operators of such submanifold with the mean curvature vector field H is space-like in $\mathbf{E}_1^5$.

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WEIGHTED PSEUDO ALMOST-AUTOMORPHIC SOLUTIONS OF QUATERNION-VALUED RNNS WITH MIXED DELAYS

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ABSTRACT

This work deals with a nonlinear differential equation for a quaternion-valued recurrent neural network(QVRNNs). Using the contraction mapping principle and some differential inequalities, sufficient conditions were obtained for the existence of weighted pseudo almost automorphic(WPAA) solutions in a certain region and the global exponential stability(GES) of these solutions. Here, methods were applied without real or complex decomposition of the equation system. In addition, an application verifying our results and its numerical simulation were given. The results generated about the WPAA solutions of the model under consideration are new.

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DOMINATION TYPE INVARIANTS FOR GRAPHS OF TWIST KNOTS

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ABSTRACT

In graph theory studies, the concept of domination is one of the main parameters. Many different types of domination are available in the literature. The domination and its types are a parameter that has been widely studied and followed. In this study, we conduct a study of the domination type invariants for graphs of twist knots, a knot family with interesting properties. We determine domination number, total domination number, edge domination number and k-domination number of these graphs. We characterize some the domination type invariants for graphs of twist knots.

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ARTIFICIAL HAMILTONIAN METHOD FOR DYNAMICS OF THE IMMUNO-PATHO SYSTEM

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ABSTRACT

Mathematical models of the immuno-patho systems are very popular in the literature. The model that we focus on in this research, describes the interaction between the immune system and a pathogen to address the importance and implications of transients in the dynamics of infectious disease. The aim of this paper to analyze the model of the dynamic interaction between the immune system and a pathogen is a time-dependent, two-variable, nonlinear system of ordinary differential equations via the artificial Hamiltonian method. The main idea of this method presents a novel algorithm to solve dynamical systems of first-order ordinary differential equations which can be written as a non-standard or partial Hamiltonian system. By applying the artificial Hamiltonian method first integrals of the aforementioned immuno-patho system are presented.

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FAREY SEQUENCE, LINEAR DIOPHANTINE EQUATIONS AND MODULAR GROUP

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ABSTRACT

Modular group $\Gamma = PSL(2, \mathbb{Z})$ is the projective special linear group of 2×2 matrices over the ring of integers with determinant one. This group is the quotient group $SL(2, \mathbb{Z})/\pm I$, hence each matrix $\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ represents the same element with its negative $\begin{pmatrix} -a & -c \\ -b & -d \end{pmatrix}$. There are strong relations between modular group and Farey sequence. Farey sequence of order n is a complete and ordered set of reduced rational numbers in the interval $[0, 1]$ which the denominators not exceeding n. Definition of Farey sequence can be extended to $\hat{\mathbb{Q}} = \mathbb{Q} \cup \{\infty\}$ by assuming $\infty = \frac{1}{0}$.

In this talk we give relations between Farey sequence and solutions of the linear Diophantine equation $ax + by = n$, where $a, b, n \in \mathbb{Z}$. After we obtain some results about elements of modular group.

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ON THE WELL-DEFINED SOLUTION OF A DIFFERENCE EQUATION

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ABSTRACT

In this paper, we show that non-linear difference equation with variable coefficients can be solved in closed form by using the convenient transformation. In addition, for the case when all coefficients are constant we solve new difference equation and investigated periodicity of solutions of aforementioned difference equation. Finally, we present numerical examples to support our results.

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A STUDY ON N- HYPERIDEALS OF MULTIPLICATIVE HYPERRING

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ABSTRACT

In this study, we give the definition of n-hyperideal in a multiplicative hyperrings based on the definition of n-ideal in classical ring theory, present examples and examine some basic properties of n-hyperideals. In addition, we determine the necessary and sufficient conditions for the n-hyperideals of the commutative multiplicative hyperring.

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A MULTI-STRAIN SEIR OUTBREAK MODEL WITH GENERAL INCIDENCE RATES: APPLICATION OF THE NEW CORONAVIRUS DISEASE

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ABSTRACT

The global usability analysis of the multi-epidemic model with an overall incidence rate on this page is being investigated. The problem, exposure, is modeled by a system of 4 untranslated ordinary differential equations that describe the treated individuals. The creation model is well defined, apart from its solutions, except for its positivity and speech. Generally speaking, 3 equilibrium points; disease-free equilibrium point, endemic equilibrium point according to Type i and the last endemic equilibrium point according to the species. Appropriate Lyapunov news, global applications of disease-free equilibria points are proved depending on the basic reproduction number R_0. In addition, the global practical results of the other suitable Lyapunov annotated endemic equilibrium, species with -1 reproduction number R_0^1, Type-2 reproduction number R_0^2 and species reproduction number R_0^i. Simulations are made to verify the different theoretical results. An important broad view on the application of equilibrium is presented that the generalized incidence function model covers multiple models with classical incidence rates. Comparisons were made between model results and numerical results of the new coronavirus. It is pointed out that this realized model fits well with the actual results. It is an undeniable fact that some strategies such as quarantine, isolation, wearing a mask, and disinfection have an undeniable importance in controlling the spread of the epidemic during this period of the disease.

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ON A CONFORMABLE DYNAMIC EQUATION OF SECOND ORDER

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ABSTRACT

We study the self-adjoint conformable dynamic equation of second order

$$Lx(t) = (px^{\Delta_\alpha})^{\Delta_\alpha}(t) + q(t)x^\sigma(t) = 0$$

on an arbitrary time scale $\mathbb{T}$, where $p, q \in C_{rd}$ and $p(t) \neq 0$ for all $t \in \mathbb{T}$. We prove an existence and uniqueness theorem for the solutions of an initial value problem consisting of the above-given dynamic equation and initial conditions. Then, we define the Lagrange bracket of two functions and prove the conformable Lagrange identity on time scales. After that, we derive a conformable boundary value problem of the form

$$Lx + \lambda x^\sigma = 0, \ R_a(x) = R_b(x) = 0,$$

where $Lx = x^{\Delta_\alpha \Delta_\alpha} + qx^\sigma$ such that $q : \mathbb{T} \to \mathbb{R}$ is rd-continuous, and

$$R_a(x) = \gamma_1 x(\rho(a)) + \gamma_2 x^{\Delta_\alpha}(\rho(a)),$$

$$R_b(x) = \delta_1 x(\rho(b)) + \delta_2 x^{\Delta_\alpha}(\rho(b))$$

such that $\gamma_1, \gamma_2, \delta_1, \delta_2 \in \mathbb{R}$ with $(\gamma_1^2 + \gamma_2^2)(\delta_1^2 + \delta_2^2) \neq 0$ hold. We examine some of the spectral properties of this boundary value problem.

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BLOW-UP OF THE PHENOMENON FOR SEMILINEAR PARABOLIC PROBLEMS WITH VARIABLE SOURCES

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ABSTRACT

In this paper, we establish some sufficient conditions to guarantee the existence of non-global solutions to the model for any $\eta(0)$ and also derive the upper bounds for the blow-up time and a criterion for blow-up.

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NOTES ON RANK PROPERTIES OF BLUPS IN LMM AND ITS TRANSFORMED MODEL

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ABSTRACT

Consider a linear mixed model (LMM) and its transformed model without making any restrictions on the correlation of random effects and any full rank assumptions. LMMs include both fixed and random effects and supply helpful tools to account for the variability of model parameters that affect response variables. This study concerns rank relations of covariance matrices of predictors under the original LMM and its transformed model. Our aim is to establish the rank of covariance matrices between the best linear unbiased predictors (BLUPs) of unknown vectors under considered two LMMs by using various rank formulas. We also give some results for special cases by applying the results obtained for general cases. For studies on transformation approach to linear models in the literature, see, e.g., [1, 4]. Also, for studies on BLUPs and LMMs in the literature, see, e.g., [2, 3].

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CONVERGENCE OF THE SOLUTION OF IMPULSIVE NICHOLSON'S BLOWFLIES MODEL WITH PIECEWISE CONSTANT ARGUMENT

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ABSTRACT

We prove the existence of the unique solution of impulsive Nicholson's blowflies model

$$x'(t) = b(t)\{-\delta(t)x(t) + p(t)x([t-1])e^{-a(t)x([t-1])}\}, \ t \neq n \in \mathbb{Z}^+ = \{1, 2, \dots\},$$

$$\triangle x(n) = d_n x(n), \ t = n \in \mathbb{Z}^+, \ t \geq 0$$

with the initial conditions

$$x(-1) = x_{-1}, \quad x(0) = x_0,$$

where [.] denotes the greatest integer function. Moreover, we get sufficient conditions for the convergence of the solution and give two examples to support this.

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Γ-SEMIGROUPS REGARDED AS SEMIGROUPS UNDER Γ

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ABSTRACT

There is a striking similarity between Γ-semigroups on the one hand, and semigroups on the other one. In this paper we express this similarity using the language of the category theory. To this end we consider two categories. The category Γ-**Sgrp** of Γ-semigroups and Γ-semigroup morphisms, and the category Γ ↓ **Sgrp** of semigroups under a given semigroup $(\Gamma, \bullet)$, and prove that there are functors $\Psi : \Gamma\text{-}\mathbf{Sgrp} \to \Gamma \downarrow \mathbf{Sgrp}$ and $\Psi' : \Gamma \downarrow \mathbf{Sgrp} \to \Gamma\text{-}\mathbf{Sgrp}$ such that Ψ is a left adjoint of Ψ'.

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CATEGORICAL ASPECTS OF Γ-SEMIGROUPS

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ABSTRACT

It is well known that any nonempty set Γ can be equipped with a multiplication $\bullet$ such that $(\Gamma, \bullet)$ is a group. Related to $(\Gamma, \bullet)$, we consider two categories. The first one is the category Γ-**Sgrp** of Γ-semigroups and their homomorphisms, and the second one is the category $\mathbf{Mon}(\Gamma)$ of monoids having the same group of units $(\Gamma, \bullet)$ and with morphisms those monoid homomorphisms which fix Γ. Then we define a functor $\Psi : \Gamma\text{-}\mathbf{Sgrp} \to \mathbf{Mon}(\Gamma)$ which maps each (S, Γ) to its enveloping monoid $\Omega_1(S, \Gamma)$, and another functor $\Psi' : \mathbf{Mon}(\Gamma) \to \Gamma\text{-}\mathbf{Sgrp}$ which maps each monoid M to its Γ semigroup of units (M, Γ), and prove that Ψ is a left adjoint of Ψ'.

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SOME CURVATURE CONDITIONS OF KENMOTSU MANIFOLDS

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ABSTRACT

In this study, some curvature conditions of Kenmotsu manifolds are examined and a concrete example is given for such manifolds.

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ASSOCIATED CURVES DEPENDING ON THE TYPES OF BISHOP FRAME

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ABSTRACT

In this study, the evolute curves, Bertrand curves and Mannheim curves of the normal indicatrix of a regular curve are examined in Euclidean 3-space. On the other hand, using the Frenet frame of the normal indicatrix of a regular curve, the versions of Bishop frame are obtained. Considering these associated curves with together the versions of Bishop frame, we say that elements of the version frames correspond to associated curves of the normal indicatrix of a regular curve.

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SMARANDACHE CURVES ACCORDING TO ALTERNATIVE FRAME IN $\mathbb{E}^3$

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ABSTRACT

In this study, we focus on Smarandache curves which is a special class of curves. These curves have previously been studied by many authors in different spaces. We will re-characterize these curves with the help of an alternative frame different from Frenet frame. Also, we will obtain frame elements, curvature and torsion of these curves.

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SOLITON SOLUTIONS OF SOME NONLINEAR EVOLUTION EQUATIONS ARISING IN MATHEMATICAL PHYSICS

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ABSTRACT

In the modern advancement, nonlinear evolution equations still take much attention due to the applications in technology and science. This study scrutinizes soliton solutions for some evolution equations arising in mathematical physics by an analytical approach. To this reason, the Calogero-Bogoyavlenskii-Schiff equation, $(2 + 1)$ dimensional KdV4 equation and the nonlinear Jaulent-Miodek hierarchy equation have been considered and periodic, dark and singular soliton solutions to these equations have been attained. Results have been verified by Mathematica and the plots have been given to interpret the nature of the solutions.

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ON SUBPROJECTIVITY DOMAINS OF GOLDIE TORSION MODULES

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ABSTRACT

In this study, we investigated subprojectivity domains of goldie torsion modules. A module X is called to be Y-subprojective if for every epimorphism $\pi : P \to Y$ and every homomorphism $\alpha : X \to Y$, there exists a homomorphism $\gamma : X \to P$ such that $\pi\gamma = \alpha$. For any module X, the subprojectivity domain $\underline{\mathfrak{Pr}}^{-1}(X)$ of X is defined to be the collection of all modules Y such that X is called to be Y-subprojective. The smallest possible subprojectivity domain of a goldie torsion module is the class of ec-flat modules. Ec-flat modules are studied and introduced in [1]. Nonsingular modules and projective modules are clear examples of ec-flat modules.

Goldie torsion modules whose subprojectivity domain is smallest as possible will be called gp-indigent. Properties of subprojectivity domains of goldie torsion modules and of gp-indigent modules are studied.

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GLOBAL NONEXISTENCE OF THE HIGHER ORDER KIRCHHOFF TYPE SYSTEM WITH LOGARITHMIC NONLINEARITIES

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ABSTRACT

In this work, we consider higher order Kirchhoff type system with logarithmic nonlinearities. Logarithmic nonlinearities occur naturally in supersymmetric field theory and inflation cosmology. In addition to, there are applications in many branches of physics such as, geophysics optics and nuclear physics. According to available literature, some authors studied different equation with logarithmic nonlinearity. We study finite time blow up of solutions for positive initial energy.

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MATHEMATICAL BEHAVIOR FOR A PETROVSKY TYPE EQUATION WITH MEMORY TERM AND LOGARITHMIC SOURCE TERM

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ABSTRACT

In this present, our aim is to establish the nonexistence for Petrovsky type equation memory term and logarithmic nonlinearity. Based on the concavity method, the main ingredient of this study is to construct several conditions for initial data leading to the nonexistence of solution in case positive initial of energy functional. The logarithmic nonlinearity is encountered naturally in quantum mechanics, inflation cosmolog, supersymmetric field theories [1]. The authors considered the different works regarding with analysis of equation with logarithmic source term [2, 3, 4, 5, 6].

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ENLARGEMENT OF BOUNDED SEQUENCE SPACE VIA NATURAL DENSITY

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ABSTRACT

In this talk I will talk about how can we enlarge some spaces with the help of natural density. This enlargements will allows us to understand how can we use the notion of small sets for the purpose of generalize the existing ideas. I will also search for answer for questions like "Are the obtained spaces also Banach space?", "Are the cardinal numbers of existing and obtained spaces different?". Lastly, I will mention about whether we can compare the density-like methods or not.

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BLOW-UP OF SOLUTIONS TO A PARABOLIC SYSTEM WITH VARIABLE SOURCES

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ABSTRACT

In this paper, we establish some sufficient conditions on variable sources and parametris to guarantee the existence blow-up of solutions parabolic system with variable sources.

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ON QUATERNIONIC BERTRAND CURVES IN EUCLIDEAN 3-SPACE

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ABSTRACT

In this article, quaternionic Bertrand curves are examined. First, algebraic properties and basic definitions and theorems of quaternionic are given. Later, some characterizations of quaternonic Bertrand curves in the 3D Euclidean space are obtained. As a result, it are observed that the characterizations obtained by Euclidean inner product for spatial quaternionic Bertrand curves are the same as the characterizations obtained from the quaternonic inner product.

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NON-NEWTONIAN GENERATING FUNCTIONS AND THEIR APPLICATIONS

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ABSTRACT

In this study, generating functions in Non-Newtonian calculus were introduced and some of their properties were shown. Generating functions of some sequences were investigated for the Geometric, Anageometric and Bigeometric calculus within the scope of Non-Newtonian calculus. Generating Functions corresponding to known numbers such as Fibonacci and Lucas numbers were represented in these three classes of Non-Newtonian calculus and the differences between these representations were revealed.

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A CHARACTERIZATION OF BIPARTITE WELL-COVERED GRAPHS

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ABSTRACT

A graph is *well-covered* if every maximal independent set in the graph is of the same size. We are interested in well-covered bipartite graphs which are also known as *very well-covered graphs* where the size of any graph is twice of its independence number. Those graphs were studied in [1, 2]. In this talk, we present a new characterization of well-covered bipartite graphs.

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ON p-CONVEX FUNCTIONS AND HERMITE-HADAMARD TYPE INEQUALITIES

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ABSTRACT

In this paper the concept of p-convex function based on the definition of p-convex sets is introduced. Then, some characterizations and fundamental properties of these functions are given. Furthermore, Hermite-Hadamard type inequalities for p-convex functions are obtained.

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ON s-CONVEX FUNCTIONS

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ABSTRACT

In this paper, s-convex functions in the first, second, third and fourth sense and some of their basic properties are introduced. In addition, some relations between these functions are studied.

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GENERALIZATION OF PRODUCT MEASURABLE SPACES

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ABSTRACT

Since the direct cartesian product of any two measurable spaces is not a measurable space, a detailed way will be given to construct an appropriate measure for subsets of $X_1 \times X_2 \times \cdots \times X_n$ where $(X_1, \Im_1, \mu_1), (X_2, \Im_2, \mu_2), \ldots, (X_n, \Im_n, \mu_n)$ are arbitrary measurable spaces. Rectangles of $\prod_{i=1}^{n} X_i$ will build up a ring and so a $\sigma-$ring. By monotone classes lemma and unique extension theorems a measure will be found.

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ON *-BOUNDEDNESS AND *-LOCAL BOUNDEDNESS OF NON-NEWTONIAN SUPERPOSITION OPERATORS IN $c_{0,\alpha}$ AND c_α TO $\ell_{1,\beta}$

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ABSTRACT

Many investigations have been made about of Non-Newtonian calculus and superposition operators until today. Non-Newtonian superposition operator was defined by Sağır and Erdoğan in [9]. In this study, we have defined *- boundedness and *-locally boundedness of operator. We have proved that the non-Newtonian superposition operator $_NP_f : c_{0,\alpha} \to \ell_{1,\beta}$ is *-locally bounded if and only if f satisfies the condition $(NA_2\prime)$. Then we have shown that the necessary and sufficient conditions for the *-boundedness of $_NP_f : c_{0,\alpha} \to \ell_{1,\beta}$. Finally, the similar results have been also obtained for $_NP_f : c_\alpha \to \ell_{1,\beta}$.

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NONEXISTENCE OF GLOBAL SOLUTIONS FOR A KIRCHHOFF-TYPE VISCOELASTIC EQUATION WITH DISTRIBUTED DELAY

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ABSTRACT

In this paper, we consider a Kirchhoff-type viscoelastic equation with distributed delay and source terms. We obtain the nonexistence of global solutions under suitable conditions.

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BLOW-UP RESULTS FOR A VISCOELASTIC PLATE EQUATION WITH DISTRIBUTED DELAY

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ABSTRACT

In this paper, we consider a nonlinear viscoelastic plate equation with distributed delay. Under suitable conditions, we obtain the blow-up of solutions with distributed delay and source terms.

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SOME PROPERTIES OF CARTESIAN PRODUCTS OF THE ZERO DIVISOR GRAPHS

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ABSTRACT

For a commutative ring R , the zero-divisor graph of R,denoted by $\Gamma(R)$, is a graph whose vertices are non-zero zero divisors of R. In here, any two vertices u and v are adjacent if and only if $u.v = 0$.

In this paper, we examined some graph parameters as diameter, radius, girth, degree sequence, maximum degree, minimum degree, irregularity index, domination number, clique number, chromatic number for the Cartesian product of the graphs $\Gamma(Z_{p^3})$ and $\Gamma(Z_{q^3})$, where p and q are primes. Further, we calculated the first and second Zagreb indices of the graph $\Gamma(Z_{p^3}) \times \Gamma(Z_{q^3})$. The obtained result are supported by numerical examples.

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ON SOME NEW HERMITE-HADAMARD TYPE INEQUALITIES FOR FUNCTIONS WHOSE nTH DERIVATIVES ARE (η_1, η_2)-STRONGLY CONVEX

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ABSTRACT

The aim of this paper, is to establish some new inequalities of Hermite-Hadamard type by using (η_1, η_2) −strongly convex function via whose nth derivatives in absolute value at certain powers. Moreover, we also consider their relevances for other related known results.

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A STUDY ON PICTURE FUZZY SETS

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ABSTRACT

Recently, the concept of picture fuzzy sets (*pf*-sets) has propounded as a generalization of intuitionistic fuzzy sets to overcome further uncertainties than intuitionistic fuzzy uncertainties. In this paper, this concept and some of its operations are modified to ensure its consistency. Afterwards, some of the basic properties of the modified *pf*-sets are investigated. Finally, the need for further research is discussed.

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ON MIDPOINT TYPE INEQUALITIES FOR CO-ORDINATED CONVEX FUNCTIONS VIA GENERALIZED FRACTIONAL INTEGRALS

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ABSTRACT

In this study firstly, we prove an identity for twice partially differentiable mappings involving the double generalized fractional integral. By using the this obtained identity, we establish some midpoint type inequalities for differentiable co-ordinated convex functions. Furthermore, by special cases of our main results, we obtain several new inequalities for Riemann-Liouville fractional integrals and k-Riemann-Liouville fractional integrals.

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ON NEW INEQUALITIES OF HERMITE-HADAMARD TYPE FOR FRACTIONAL INTEGRALS

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ABSTRACT

In the present paper, we prove a new version of the Hermite-Hadamard inequality for generalized fractional integrals. We also establish a new identity for generalized fractional integrals. Furthermore, the fractional integral operators have been applied to Hermite Hadamard type integral inequalities to provide their generalized properties.

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INTUITIONISTIC FUZZY QUASI-INTERIOR IDEALS OF SEMIGROUPS

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ABSTRACT

The notion of quasi-interior ideal was defined by M. Murali Krishna Rao as a generalization of bi-ideal, quasi-ideal and interior ideal of semigroups. In the continuation of this study, fuzzy quasi-interior ideal of semigroups was introduced.

In this study, it is purposed to introduced the concept of quasi-interior ideal on intuitionistic fuzzy semigroups. The concept introduced was supported with examples and its basic algebraic properties were examined.

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MATHEMATICAL MODELING OF MEASLES OUTBREAK WITH TWO PATCHES

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ABSTRACT

Mathematical modeling of measles disease is a powerful tool to examine disease progression [1]. In this work, we investigate a patchy SVEIS model with susceptible, vaccinated, exposed and infectious compartments for measles outbreak between two countries, namely Turkey (Country 1) and one of its neighbors (Country 2). We study three different disease transmission pathways. In particular, we consider the reciprocal migration of two susceptible compartments, mutual migration of infected individuals and their combination [2]. At first, based on the measles incidence data of Turkey in 2001 [3], we estimate the parameter values in the single-patch model by data fitting [4]. All parameters, other than transmission coefficient of Country 2 and migration rates, are assumed to be the same as the parameter values of Country 1 to follow their effect to the outbreak. Then, we obtain the disease-free equilibrium (DFE) point and the basic reproduction number R_0 under four different conditions. In all cases, $R_0 < 1$ which means that the DFE point is locally asymptotically stable. Finally, we observe that the simulation results obtained in MATLAB are consistent with stability analysis. Moreover, we deduce that both of the contact rates and migration rates must be carefully controlled since they not only affect the number of infected individuals but also the peak of the outbreak.

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GEOMETRIC CHARACTERIZATIONS OF THE TUBULAR SURFACES

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ABSTRACT

Canal surface is defined as an envelope of the circles whose lie on the normal plane of a space curve. The tubular surface is canal surface with constant radius. In this paper, we purpose to give some properties about the tubular surfaces. We obtain some theoretical results of these surfaces and will be explained on the examples. Also, we give the visualizations of these examples by using the mathematica program language.

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A CONTRIBUTION TO THE FIXED-DISC RESULTS ON S-METRIC SPACES

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ABSTRACT

In this paper, we prove some fixed-disc results using new contrations. To do this, we define the notions of Jleli-Samet type x_0-S-contraction and Li-Jiang type x_0-S-contraction. Also, we obtain an equivalent theorem using these type contractions Finally, we give an illustrative example.

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NEW FIXED-CIRCLE RESULTS ON SOFT METRIC SPACES

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ABSTRACT

Fixed-circle problem has been studied as a geometric generalization of the fixed-point theory on various metric spaces. To obtain new solutions to this problem, in this talk, we give some fixed-circle theorems on a soft metric space using different contractive conditions. The obtained results generalize some known fixed-circle theorems in the literature. Also, we support our results with illustrative examples.

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THE INTUITIONISTIC FUZZY PROMETHEE METHOD: AN ORIGINAL APPLICATION

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ABSTRACT

In this paper applied the intuitionistic fuzzy theory-based PROMETHEE method, to the field of education. The aim is to bring novelty in the field of education and to create a new education system that regulates. A multi-criteria decision making algorithm was created with intuitionistic fuzzy theory through using the PROMETHEE method in order to create a training module appropriate for individuals. In this paper, controlled sets are used to express the importance of the criteria in the intuitionistic fuzzy PROMETHEE method in the form of intuitionistic fuzzy values.

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A GENERALIZATION OF SZÁSZ-KANTOROVICH OPERATORS

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ABSTRACT

The Theory of Approximation started with Weierstrass theorem in 1885 and continued with the example given in 1912 by Bernstein in Weierstrass in theorem.value problems. Accelerated in 1951 with Korovkin theorem. It has been going on rapidly since then. In order to obtain smooth curves and surfaces (in the range of Bernstein polynomials $[0, 1]$), non-uniform curves and surfaces are approached with Szasz operators. In this thesis, in 1950 a generalization of Szasz operators, defined as a generalization of Bernstein polynomials, will be studied. Szasz operators are $[\{S_n\}(f; x) = e^{-nx} \sum_{k=0}^{\infty} \frac{(nx)^k}{k!} f\left(\frac{k}{n}\right)]$, $[0 \leq x < \infty]$ In this thesis we will study the operators $[Z_n(f; x) = \frac{n(n+b)}{n+a} e^{-nx} \sum_{k=0}^{\infty} \frac{(nx)^j}{j!} \int_{\frac{j \cdot (n+a)}{n(n+b)}}^{\frac{(j+1)(n+a)}{n(n+b)}} f(t) \, dt]$

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A NOTE ON MODIFICATION OF BERNSTEIN POLYNOMIALS BASED ON POST-QUANTUM CALCULUS

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ABSTRACT

In this work, we introduce a modification of Bernstein polynomials related on post-quantum calculus. We evaluate some prelimaniries results such as moments, central moments and derive Korovkin type approximation theorem. Also, we estimate the order of convergence by means of the moduli of continuity and for a function belong to the Lipschitz type class. Further, we prove Voronovskaya-type asymptotic theorem.

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ON APPROXIMATION PROPERTIES OF λ-SZÁSZ-DURRMEYER OPERATORS

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ABSTRACT

In this paper, we study some approximation properties of $\lambda-$Szász-Durrmeyer operators. Firstly, we obtain some moments and central moments. Next, we estimate the rate of convergence in terms of the usual moduli of continuity, Lipschitz type class and Peetre's K-functional, respectively. Moreover, we investigate Korovkin type approximation and Voronovskaya type asymptotic theorem for these operators. Finally, by the help of Maple software, we give the comparison of the convergence of these newly defined operators to the certain functions with some illustrations.

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GREEN'S FUNCTION FOR MULTIPLICATIVE STURM-LIOUVILLE PROBLEM

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ABSTRACT

In this study, we construct Green's function for the multiplicative Sturm-Liouville equation. This function is defined as the multiplicative (or $^{*}-$) Green's function. And, the basic properties of the multiplicative Green's function are given. Then, the multiplicative Sturm-Liouville equation is evaluated by using this function. Effectiveness of Green's function in multiplicative case will thus be seen by some examples.

The papers [1–9] to which the present study is related.

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NONLINEAR P-LAPLACIAN FRACTIONAL BOUNDARY VALUE PROBLEMS WITH INTEGRAL BOUNDARY CONDITIONS

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ABSTRACT

The theory of fractional calculus is a branch of mathematics that deals with the study and applications of arbitrary order derivatives and integrals. (See [2, 3]) The area of fractional calculus and fractional differential equations is of great significance because there are many applications of fractional boundary value problems in various research areas such as mechanics, electricity, chemistry, biology, engineering, economy, control theory etc. At the same time existence results of positive solutions for fractional boundary value problems are studied by many authors. For instance in [4], Liu et al. studied existence results of positive solutions for a nonlinear p-Laplacian boundary value problem by using fixed point theorems on cones.

In this talk a nonlinear p-Laplacian boundary value problem with integral boundary condition is considered. By means of the Leggett-Williams fixed point theorem on cones [1] and the inequalities of the Green's function, an existence result of three positive solutions is established for a nonlinear p-Laplacian boundary value problem of fractional order. Also, an example is given to support our theoritical result.

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A NUMERICAL SOLUTION OF MHD JEFFERY–HAMEL MODEL ARISING IN FLUID MECHANICS

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ABSTRACT

This study is concerned with obtaining a numerical solution of third order MHD Jeffery–Hamel nonlinear differential equation arising in fluid dynamics, by constructing a matrix-collocation method involving the Nörlund polynomial, matrix expansions of linear and nonlinear terms, and collocation points. The method runs easily on a computer programme, which is devised specifically for the model, after gathering its all matrix compounds into a unique matrix equation. Hence, the precise numerical and graphical results are demonstrated in table and figures, respectively. These comparable tools allow us to discriminate the efficiency and accuracy of the method. One can thus observe that the method is eligible scheme to treat the equation in question.

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COMBINED SLOBODA GOMPERTZ GROWTH MODEL

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ABSTRACT

In this study, a new growth model is proposed and its properties are given. In order to analyze the performance of the proposed model an application was made on the real data set and the results were presented in tables and graphics.

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NUMERICAL EXPERIMENTS WITH AN INFEASIBLE PRIMAL-DUAL ALGORITHM FOR SOLVING THE SEMIDEFINITE LEAST SQUARES PROBLEMS

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ABSTRACT

This paper focuses on the numerical resolution of a Semi-definite least squares problems ($SDLS$) by an infeasible primal-dual type interior-point method based on the directions of Alizadeh-Haeberly-Overton (AHO) (Monteiro, 1997). Moreover, we also present some numerical experiments to illustrate the efficiency of this algorithm and a conclusion that ends the article is stated.

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SOME CHARACTERIZATIONS OF RULED SURFACES GENERATED BY S- CURVES

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ABSTRACT

In this paper, we construct and study timelike special ruled surfaces, which are generated by S- Curves, in Minkoswki 3- Space. We investigate different properties of the constructed ruled surface.

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SUMMABILITY OF SPLICED SEQUENCES

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ABSTRACT

Recently Osikiewicz [1] has studied the summability of spliced sequences. A spliced sequence is formed by combining all of the terms of two or more convergent sequences, in their original order, into a new spliced sequence [1]. Osikiewicz has shown that A-limits of spliced sequences are closely related to A-densities of the sets in the partition. Furthermore, Unver et al. [2] have investigated the summability of spliced sequences in metric spaces and given the Bochner integral representation of A-limits of the spliced sequences in Banach spaces. Next in [3] replacing convergent sequences by bounded sequences, they have given some inequalities that help us to approximate the core of transformation of a spliced sequence. The results in [3] also reduce to Osikiewicz's equalities in special cases. This seminar is a compilation of above mentioned articles.

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COMPOSITIONS OF POSITIVE INTEGERS AND THE PADOVAN NUMBERS

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ABSTRACT

The Padovan sequence $\{P_n\}_{n \geq 0}$ is defined by the third order recurrence

$$P_{n+3} = P_{n+1} + P_n \tag{1}$$

with the initial conditions $P_0 = 1$, $P_1 = 0$ and $P_2 = 1$. The Padovan sequence appears as sequence A000931 on the On-Line Encyclopedia of Integer Sequences (OEIS) [1]. For relevance, we consider as $P_{-2} = P_{-1} = 0$. In [2] the Padovan polynomial sequence $\{P_n(x)\}_{n \geq 0}$ is defined by a third order recurrence

$$P_{n+3}(x) = x P_{n+1}(x) + P_n(x) \tag{2}$$

with the initial conditions $P_0(x) = 1$, $P_1(x) = 0$ and $P_2(x) = x$. For relevance, we consider as $P_{-2}(x) = P_{-1}(x) = 0$. To simplify notation, take $P_n(x) = \mathcal{P}_n$.

A composition of an integer n is a representation of n as a sum of positive integers, for example the eight compositions of 4 are as follows: $4, 3+1, 1+3, 2+2, 2+1+1, 1+2+1, 1+1+2, 1+1+1+1$. A partition of n is a representation of n as a sum of positive integers where the order of the summands is considered irrelevant[5]. A composition of a positive integer n is an ordered sum of $1s$ and $2s$ [3, 4]. For example, 2 has two distinct such compositions, and 3 has three, and 4 has five.

In the present work, we study compositions of positive integers with 2s and 3s. We prove that these compositions can be given in terms of Padovan numbers. We create some flooring models of these compositions related to the Padovan numbers.

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SOME NOTES ON THE PLASTIC CONSTANT

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ABSTRACT

The Padovan sequence is named after Richard Padovan who attributed its discovery to Dutch architect Hans van der Laan in his 1994 essay Dom. The Padovan sequence $\{P_n\}_{n \geq 0}$ is defined by

$$(1) \qquad P_0 = P_1 = P_2 = 1 \quad \text{and} \quad P_{n+3} = P_{n+1} + P_n$$

for all $n \geq 0$. Here, P_n is the nth Padovan number. First few terms of this sequence are $1, 1, 1, 2, 2, 3, 4, 5, 7, 9, 12, 16, 21$. The ratio of successive the Padovan number converges to the plastic constant. As n gets larger, it appers that $\frac{P_{n+1}}{P_n}$ approaches a limit, namely,

$$1,32471795724474602596\ldots$$

The plastic number p (also known as the plastic constant, the plastic ratio, the platin number and the minimal Pisot number) is a mathematical constant which is the unique real solution of the cubic equation

$$x^3 - x - 1 = 0.$$

It has the exact value

$$p = \sqrt[3]{\frac{9 + \sqrt{69}}{18}} + \sqrt[3]{\frac{9 - \sqrt{69}}{18}}$$

that was firstly defined in 1924 by Gerard Cordonnier. He described applications to architecture and illustrated the use of the plastic constant in many buildings (for the details see [1, 2, 3]). Its decimal expansion begins with

$$\alpha \approx 1.3247 = p = Plastic \quad ratio.$$

In the present work we construct the plastic number in three-dimensional space. We examine the nested radicals and continued fraction expansions of the plastic ratio. Also, we give some properties and geometric interpretations of the plastic constant.

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KINEMATICS APPLICATIONS OF ONE-PARAMETER UMBRELLA MOTIONS USING DUAL TRANSFORMATIONS

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ABSTRACT

Homothetic motions and umbrella motions are defined with the help of dual transformations in Euclidean and Lorentzian spaces in [1]. In this study, we examine kinematics applications of one-parameter umbrella motions in both spaces. We also dwell on these motions in dual spaces.

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ONE-PARAMETER HOMOTHETIC MOTIONS WITH QUATERNIONS AND THEIR GEOMETRIC APPLICATIONS

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ABSTRACT

Quaternions and their geometric applications using dual transformations are examined in [1]. Homothetic motions with dual transformations are defined in [2]. In this study, we investigate one-parameter homothetic motions with quaternions. Additionally, we give their geometric applications in real and dual spaces.

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REDUCTION ALGORITHMS FOR SECOND ORDER LOGIC

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ABSTRACT

Logical systems has degrees which is add expression power to language. Second order logic is extension of first order logic which is itself extension of classical logic. While first order logic can only incorporates with for all elements, second order logic incorporates for all properties into the syntax. In some cases, second order formula can be logically correspond to a first order formula. Some reduction algorithms and techniques have been developed for computing a first-order equivalent of a second-order formula. Thanks to these reduction algorithms, sometimes we can pass through from second order logic to first order logic. In this work we are focus on DLS and SCAN algorithms, we introduce these algorithms and compare their effectiveness. The algorithms takes as input a second order formula and either returns as output an equivalent first order formula or terminates with failure. DLS basically work on quantifiers using Skolemization techniques. SCAN algorithm is related to the method of eliminating existential monadic second-order quantifiers.

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NEW TYPES CONTINUITY

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ABSTRACT

In this talk, by using natural density (see in [2]) symmetric continuity, weak continuity, weak symmetric continuity which was investigated in [1] will be generalized. Some basic properties of generalized form will be given with several useful examples.

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APPLICATION OF ADJACENCY SEQUENCES IN CHARACTERIZING REGULAR BIPOLAR FUZZY GRAPHS

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ABSTRACT

In this paper, adjacency sequence, first and second fundamental sequences are defined in a bipolar fuzzy graph with example. Some examples are constructed to show that if G is a regular bipolar fuzzy graph, the underlying crisp graph need not be regular and all the vertices need not have the same adjacency sequences. Also it is shown that if a bipolar fuzzy graph G and its underlying crisp graph are regular, all the vertices need not have the same adjacency sequences. A necessary and sufficient condition is established for a BFG with at most four vertices to be regular using the concept of adjacency sequences. Moreover, some characterizations have been made for a line graph and the complement of a regular bipolar fuzzy graph to be regular.

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SINGULARITIES OF SOME FUNCTIONS IN GALILEAN SPACE

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ABSTRACT

In this study, we discuss the concept of geometry, the emergence of different geometries and some basic properties of Galilean space. We also give the necessary conditions for the singularities of a function in the Galilean space.

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CATEGORICAL PROPERTIES OF INTUITIONISTIC FUZZY GROUPS

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ABSTRACT

The category theory deals with mathematical structures and relationships between them. Categories now appear in most branches of mathematics and in some areas of theoretical computer science and mathematical physics, and acting as a unifying notion. In this paper we study the relationship between the category of groups and the category of intuitionistic fuzzy groups. We proved that the category of groups is a subcategory of category of intuitionistic fuzzy groups and that it is not an abelian category. We established a function $\beta : Hom(A, B) \to [0, 1] \times [0, 1]$ on the set of all intuitionistic fuzzy homomorphisms between intuitionistic fuzzy groups A and B of groups G and H respectively. We proved that β is a covariant functor from the category of groups to the category of intuitionistic fuzzy groups. Further, we show that the category of intuitionistic fuzzy groups is a top category by establishing a contravariant functor from the category of intuitionistic fuzzy groups to the lattices of all intuitionistic fuzzy groups.

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SIMPLE AND SEMI-SIMPLE INTUITIONISTIC L-FUZZY MODULES

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ABSTRACT

This paper, discuss the notions of simple and semi-simple intuitionistic L-fuzzy module of an R-module M. It is proved that when L is regular lattice then an R-module M is simple if and only if χ_M is intuitionistic L-fuzzy simple module. We also proved that, if A is an intuitionistic L-fuzzy semi-simple module, then every (α, β)-cut set of A is semi-simple, where $\alpha, \beta \in L \backslash \{0\}$ with $\alpha \leq N(\beta)$ and further when L is also regular then support of intuitionistic L-fuzzy semi-simple module is also semi-simple also in this case A contains a simple submodule. Some equivalent conditions for semisimplicity of intuitionistic L-fuzzy module are also obtained. Further we proved that when L is a regular complete Brouwerian lattice, then every strictly proper intuitionistic L-fuzzy submodules of a semi-simple module is intuitionistic L-fuzzy semi-simple.

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INTUITIONISTIC L-FUZZY ESSENTIAL AND CLOSED SUBMODULES

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ABSTRACT

Let R be a commutative ring with identity and M be an R-module. An intuitionistic L-fuzzy submodule (ILFSM) C of an intuitionistic L-fuzzy module A of R-module M, is called an intuitionistic L-fuzzy essential submodule in A, if $C \cap B \neq \chi_{\{\theta\}}$ for any non-trivial ILFSM B of A. In this case we say that A is an essential extension of C. Also, if C has no proper essential extension in A, then C is called an intuitionistic L-fuzzy closed submodule in A. Further, for ILFSMs B, C of A, C is called complement of B in A if C is maximal with the property that $B \cap C = \chi_{\{\theta\}}$. We study these mentioned notations which are generalization of the notions of essential submodule, closed submodule and complement of a submodule in the intuitionistic L-fuzzy module theory. We prove many basic properties of both these concepts.

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LOCAL T_0 AND T_1 CONSTANT FILTER CONVERGENCE SPACES

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ABSTRACT

The aim of this paper is to characterize local forms of T_0 and local forms of T_1 constant filter convergence spaces and to investigate the relationships between them as well as to show that the full subcategories of the category of constant filter convergence spaces consisting of local T_0 and local T_1 constant filter convergence spaces are productive, coproductive, and hereditary.

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A UNIQUENESS THEOREM FOR A DIFFUSION OPERATOR WITH THE SPECTRAL PARAMETER IN BOUNDARY CONDITIONS ON A COMPACT SET

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ABSTRACT

This study deals with the second-order differential pencil with quadratic dependence on the spectral parameter on a special compact set $T = [0, a_1] \bigcup [a_2, l]$. We consider the following boundary value problem on T,

$$-y^{\Delta\Delta}(t) + \left(q_0(t) + 2\lambda q_1(t) \right) y(\sigma(t)) = \lambda^2 y(\sigma(t)), \quad t \in T,$$

$$\lambda \left(y^{\Delta}(0) + h_0 y(0) \right) - h_1 y^{\Delta}(0) - h_2 y(0) = 0,$$

$$\lambda \left(y^{\Delta}(l) + H_0 y(l) \right) - H_1 y^{\Delta}(l) - H_2 y(l) = 0.$$

Here, $y^{\Delta}(t)$ denotes delta-derivative of $y^{\Delta}(t)$ and $\sigma : T \to T$ denotes forward jump operator, $q_0(t)$ and $q_1(t)$ is a real-valued continuous function on T, $h_2 - h_1 h_0 > 0$, $H_1 H_0 - H_2 > 0$ and λ is the spectral parameter. We study the interior-inverse problem and show that the eigenvalues and the logarithmic delta-derivatives of the eigenfunctions at a_1 are sufficient to determine uniquely the coefficients $q_0(t)$ and $q_1(t)$.

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APPROXIMATION BY TAYLOR TYPE GAUSS-WEIERSTRASS OPERATORS

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ABSTRACT

In this study, We examined the approximation properties of Taylor type Gauss-Weierstrass integral operators in weighted spaces and showed the approximation properties by means of the weighted modulus of smoothness. Then, we presented the Voronovskaya type theorems. We have shown that this operator based on this r parameter obtains a faster approximation than the classical Gauss-Weierstrass integral operators.

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A NOTE ON TORSION-BY-NILPOTENT GROUPS

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ABSTRACT

In this work, we study on torsion-by-nilpotent groups. Recall that a torsiyon group (or periodic group) is a group all of whose elements have finite order. Let T be a torsion group of G. If T is normal subgroups of G such that G/T is a nilpotent group then G is a torsion-by-nilpotent group. A group class of groups $\mathcal{X}$ is a class in the usually sence, consisting of groups, with two additional properties: (i) $G_1 \cong G \in \mathcal{X}$ implies that $G_1 \in \mathcal{X}$, (ii) $\mathcal{X}$ contains a trivial(or unit) group. Let $\mathcal{X}$ be a class of groups. Denote by $(\mathcal{X}, \infty)$(respectively, $(\mathcal{X}, \infty)^*$) the class of groups in which every infinite subset contains two distinct elements x, y such that $\langle x, y \rangle$ (respectively, $\langle x, x^y \rangle$) belong to $\mathcal{X}$. The origin of this type of problems is a result of B.H. Neumann [3] which asserts that a group is centre-by-finite if and only if every infinite subset contains that a commuting pair of distinct elements. Here we consider the class $(\mathcal{X}, \infty)$ when $\mathcal{X}$ is the class $\mathcal{TN}$ of torsion-by-nilpotent groups, where $\mathcal{N}$ (respectively, $\mathcal{T}$) denotes the class of nilpotent (respectively, torsion). It is showned that a finitely generated soluble group in the class $(\mathcal{TN}, \infty)$ is torsion-by-nilpotent groups, [2, Teorem 1]. In addition it is extended the result optained on $(\mathcal{TN}, \infty)$ to the class $(\mathcal{TN}, \infty)^*$ [in 1]. Thus, some lemmas are given for such groups and the following result is obtained and the proof of this result is proved in detail. A finitely generated soluble-by-finite group in the class $(\mathcal{TN}, \infty)^*$ is torsion-by-nilpotent [1, Theorem1.1]

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FUZZY AND INTUITIONSTIC FUZZY PLANER GRAPHS

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ABSTRACT

Fuzzy graph is a very important research area due to its wide applications. Fuzzy multigraphs are very important subclass of fuzzy planar graphs and intuitionistic fuzzy planar graphs. These graphs are defined in a very novel approach by exploring the concept of fuzzy sets. In our study, if two edges are crossed at a point of a fuzzy graph, then the graph may be considered as a planar graph with certain degree of planarity. A lot of properties are obtained for these graphs. A very close association of fuzzy planar graph is fuzzy dual graph. This is also defined and studied several properties. The relation between fuzzy planar graph and fuzzy dual graph is also established.

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EIGENVALUES OF INTERVAL-VALUED FUZZY GRAPH AND THEIR APPLICATION FOR INVESTIGATION OF ECOLOGICAL SYSTEM

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ABSTRACT

Finding eigenvalues and eigenvectors of a matrix is a very difficult task for a large matrix. Many papers have been published for finding eigenvalues and eigenvectors of a fuzzy matrix (FM) (i.e. matrix with membership values) as well as a fuzzy graph. But, all papers determine such parameters based on conventional arithmetic operators, though the valid operations on FMs are max-min. To the best of our knowledge no papers are published to find eigenvalues and eigenvectors based on max-min operators. In this paper, a novel method is proposed to find the eigenvectors and eigenvectors of an interval-valued fuzzy graph (IVFG) using max-min operation. The energy of an IVFG is defined and computed using max-min operators. The very much interesting part of our paper is that we discuss a real life application of eigenvalues of an IVFG for the ecological system. As the amount of food consumed by a predator from the prey is uncertain, so we can represent it as an interval-valued fuzzy membership value and it is very much appropriate for eigenvalues and eigenvectors or energy of an IVFG.

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A NOTE ON QUADRATIC CALCULUS

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ABSTRACT

In the period 1967-1972, Grossman and Katz [1] introduced the non-Newtonian calculus consisting of the branches of geometric, bigeometric, quadratic and biquadratic calculus. In this study, we construct the field R_q of quadratic real numbers. Also, we give the triangle and Minkowski's inequalities in the sens of quadratic calculus.

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TOURISM MANAGEMENT APPLICATION IN PYTHAGOREAN FUZZY SETS WITH COPRAS METHOD

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ABSTRACT

Tourism has always been an important part of economic revenue for growing countries to balance their foreign trade. But with the pandemic, there has been an incredible decline in these incomes. Therefore, governments of growing countries have provided some advantages to tourists for enliven the economy. This situation has led tourists to consider more destinations. Multicriteria decision making methods (MCDM) are very practical tools to select best possible alternatives among many. In this paper, Pythagorean fuzzy COPRAS method is applied to tourism management problem and compared with some aggregation operators.

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AN APPROACH TO EVALUATING INVESTMENT OPPORTUNITIES IN INTUITIONISTIC MULTIPLICATIVE SETS

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ABSTRACT

Intuitionistic fuzzy sets are useful tools to deal uncertain information on real life problems while expressing problem data with intuitionistic fuzzy numbers. But the evaluated values are in a uniform and symmetric interval. However, real life problems such as investment opportunities depend on many parameters that should be expressed by non-uniform and unsymmetrical information. Intuitionistic multiplicative information is a convenient approach to handle this kind of problems. But the shortcoming of this approach is to use of intuitionistic multiplicative preference relations rather than set based numbers. In this study, we give a decision-making method to handle investment problems with intuitionistic multiplicative sets.

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ON NEW TYPE OF ZAGREB INDEX

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ABSTRACT

Zagreb index, one of the most important topological indices, was first considered in 1970s. The first Zagreb index M_1 is equal to the sum of the squares of the degrees of the vertices and the second Zagreb index M_2 is equal to the sum of the products of the degrees of pairs of adjacent vertices. In this paper, a new graph invariant is introduced. Also lists on equality results over special graphs with respect to new type of Zagreb index are given as well as new bounds on general graphs. Moreover, the extremal new type of Zagreb indices among unicylic, bicyclic and acyclic graphs have been found by using some operations.

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COLOURING OF FUZZY DIRECTED GRAPH AND ITS APPLICATION

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ABSTRACT

Graph colouring is the way each vertex of a graph is assigned a colour. It is achieved in such a manner that neighbouring vertices are not of the same colour. In graph theory, it is fundamental. It is mostly used to address issues in the modern world, such as signals for traffic, maps, schedules and more. Social networks are currently pervasive in our lives. The users are considered vertices here and connections/interactions are taken as edges. Some users follow accounts of other prominent users in these networks and others do not. It is natural that there may be another connection between vertices together with the conventional bond (information flows). The interaction between the nodes depends on dominance. This kind of condition can be modelled as a fuzzy directed graph. Edge membership plays an essential part in colouring the fuzzy directed graph. Edge membership represents the flow of knowledge between the nodes. In addition, there might be other parameters in connection with the dominance. This direction of dominance is represented by fuzzy directed graphs. This article defines the colouring of fuzzy directed graphs dependent on the influence between nodes. This includes a chromatic number, strong chromatic number and the associated characteristics. The colouring of fuzzy directed graphs is used in an application for COVID-19.

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LOWER AND UPPER BOUNDS FOR THE BLOW UP TIME IN OF HIGHER-ORDER HYPERBOLIC TYPE EQUATION WITH LOGARITHMIC SOURCE TERM

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ABSTRACT
In this work, we considered the nonlinear higher-order hyperbolic type equation with nonlinear logarithmic nonlineraity. The blow up solutions of wave equation with logarithmic nonlinearity become a interesting area for authors [1,2,3]. By using the concavity method, we prove the upper and lower bound time for blow up time.

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GLOBAL WELL-POSEDNESS OF NONLINEAR EQUATION WITH LOGARITHMIC NONLINEARITY

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ABSTRACT

In this presentation, the existence and exponential decay results of solutions for logarithmic nonlinear equation have been discussed. The logarithmic nonlinearity is of much interest in physics, since it appears naturally in different areas of the physics [2]. Moreover, there have been some papers on the hyperbolic equation with logarithmic source term [1,3,4].

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SHORTFALL EXPECTATION AND SHORTFALL VOLATILITY FORECASTS FOR GARCH(1,1) MODEL WITH MODE-CENTERED BURR INNOVATION

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ABSTRACT

In this paper, we do forecasting risk measures of Shortfall Expectation (SE) and Shortfall Volatiliy (SV) for GARCH(1,1) model with Mode-Centered Burr innova-tion. The SE forecast calculates the average loss beyond tolerated risk known as Value-at-Risk (VaR). Meanwhile, the SV forecast computes standard devia- tion for the data beyond VaR and its corresponding mean is SE. Our marginal of GARCH(1,1) is chosen to capture not only volatility process for return (prop- erty of heteroscedasticity) but also empirical property of heavy-tail (leptokurtosis). Empirical analysis is carried out to show the performance of the future risk forecast as well as its comparison to normal or Student's t innovations.

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INTERSECTION OF FUZZY INTERSECTION GRAPHS

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ABSTRACT

Modelling of real-life problems in today's world demands extensive use of fuzzy graphs especially fuzzy intersection graphs. The uncertainties present in real world can only be handled by fuzzy logic and fuzzy set theory. In addition to this, complex real-world problems involve objects that are inter-related in such way that they cannot be handled by one particular type of fuzzy intersection graph. Keeping these problems in mind that requires repeated application of one or more kinds of intersection graphs, this article introduces the study of intersection of fuzzy intersection graphs. We have stated and proved the necessary and sufficient conditions for the existence of the same. Finding out the strengths of intersection graphs (fuzzy) and explaining the importance of studying it is also one of the aims of this article which we have carried out in detail with suitable examples and illustrations. Lastly, we establish how this newly introduced graphical model can be used effectively to find out a possible solution to regularize the routine delays of trains in Indian Railway system.

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ON A SEQUENCE SPACE DEFINED AS THE FIELD OF A TRIANGLE MATRIX

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ABSTRACT

In this study, I introduced a new sequence space by means of a special triangle matrix. As well as researching some topological and algebraic properties of mentioned sequence space, I determined Köthe-Toeplitz, generalized Köthe-Toeplitz dual and garling dual.

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SOLITARY WAVE SOLUTIONS ON COMMUNICATION TECHNOLOGY

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ABSTRACT

In this study, analytical solutions for a nonlinear partial differential equation and physical interpretations of these solutions are presented. Analytical methods, which have been very popular in recent years, are preferred for the solutions to be obtained. The similarities and differences of solitary wave solutions produced differently from each other with the help of these methods with the solutions in the literature are examined. It is emphasized that the analytical methods applied in the study are quite successful and valid in strong nonlinear equations.

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APPLICATIONS OF EXACT SOLUTIONS OBTAINED WITH THE HELP OF AN ANALYTICAL METHOD

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ABSTRACT

In this study, a system of partial differential equations that has many applications in basic sciences, both physically and chemically, is examined. Exact solutions are generated by using an appropriate analytical method for the system under consideration. In analytical methods, the main purpose is to reduce the nonlinear partial differential equation to an ordinary differential equation with the help of traditional wave transformation. With the help of this transformation, suitable values are defined in terms of physical and chemical meanings for the parameters in the traveling wave solutions. Graphics obtained from these values using computer programs are presented. The findings related to the system and method are discussed in the results and discussion section.

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COMPARISON OF SEGMENTATION PERFORMANCE OF INTUITIONISTIC FUZZY C-MEANS AND FUZZY C-MEANS CLUSTERING ALGORITHMS ON COVID-19 X-RAY IMAGES

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ABSTRACT

The COVID-19 virus, which was first detected in Wuhan province of China, affected the whole world in a short time and caused many deaths. In this study, we present a method to quickly and accurately segment lesions in the lungs of people with COVID-19. COVID-19 lung images obtained from X-ray images were segmented with intuitionistic Fuzzy C-Means (IFCM) and fuzzy C-Means algorithm after passing through pre-processing steps in the first stage [1]. Cluster validity indexes are used to determine the correct number of clusters after segmentation. An error matrix was created to measure the segmentation performance. Accuracy, sensitivity, sensitivity and f1 score values were obtained from this error matrix [2]. The pros and cons of these two algorithms used in segmentation were compared.

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SOME NEW PROPERTIES OF TRANSLATION SURFACES ON PRODUCT TIME SCALES

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ABSTRACT

In this paper, we study some properties of translation surfaces which are parameterized by a product time scale. We obtain mean and Gaussian curvatures of these surfaces on distinct time scales. Then, flatness and minimality properties are determined of these surfaces on product time scales.

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ON MOMENT OF SAMPLE MINIMUM OF ORDER STATISTICS FROM GEOMETRIC DISTRIBUTION

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ABSTRACT

In our previous studies, the expected value of the sample range of order statistics in geometric distribution has been obtained. In this study, the moment generating function of the sample minimum of the order statistics in geometric distribution was found and thus the moments of the sample minimum were calculated.

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RESIDUAL QUOTIENT OF INTUITIONISTIC FUZZY SETS OF RINGS AND MODULES AND THEIR APPLICATIONS

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ABSTRACT

In this talk, we study the concept of residual quotient of intuitionistic fuzzy subsets of ring and module and develop many properties out of these. Using the concept of residual quotient, we investigate some important characterization of annihilator of intuitionistic fuzzy submodules, intuitionistic fuzzy prime (primary) submodules and intuitionistic fuzzy prime (primary) decomposition.

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COMMUTATIVE ASSOCIATIVE BINARY OPERATIONS ON A SET WITH SIX ELEMENTS

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ABSTRACT

The main goal of this paper is to count commutative as well as associative binary operation on six element set, by using partition and composition of mapping. This is achieved using algorithm given by Sehgal et al. [2018] on commutative associative binary operations on a set with five elements and Yogesh et al. [2013] on commutative as well as associative binary operations on a set with three elements.

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ON PARTIAL DERIVATIVES OF SPLIT TRIPLET FUNCTIONS

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ABSTRACT

Quaternions and split quaternions are not commutative by multiplication. A split triplet is obtained when the coefficient of one element of the vector part of split quaternions is zero. In some special cases, triplets are commutative. In this study, partial derivatives of split triplet functions are obtained.

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ON SPLIT TRIPLET AND GRADIENT

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ABSTRACT

A triplet is the special case of a quaternion. Likewise, a split triplet is the special case of a split quaternion. In general, they are not commutative according to the multiplication process. In this paper, the gradient of split triplet functions are obtained.

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IDEALS OF A MULTIPLICATIVE SEMIGROUP IN PICTURE FUZZY ENVIRONMENT

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ABSTRACT

This paper introduces the concept of picture fuzzy ideal of a multiplicative semigroup. Also, the paper gives the notions of different types of ideals under picture fuzzy environment and establishes relationships between them. It has been shown that a picture fuzzy prime ideal of a multiplicative semigroup is a picture fuzzy primary ideal provided that the picture fuzzy prime ideal satisfies the condition of picture fuzzy subsemigroup. Also, it has been high- lighted that a picture fuzzy primary semiprime ideal is a picture fuzzy prime ideal. It has been proved that $(\theta, \emptyset, \Psi)$ - cut of a picture fuzzy prime ideal is a prime ideal and similar type of concept is also valid in case of picture fuzzy primary ideal and picture fuzzy semiprime ideal.

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SOME RESULTS RELATED TO INVERSE SUM INDEG INDEX OF GRAPHS

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ABSTRACT

Inverse sum indeg index or simply ISI index is identified in the list of 20 most important topological indices. The ISI index of a simple graph G, $ISI(G)$ is defined as the sum of the terms $\frac{d(u)d(v)}{d(u)+d(v)}$ over all the edges uv of G, where $d(u)$ denotes the degree of a vertex u of G. In this communication, we highlight three important aspects in the study of topological indices viz., extension, generalization and analysis of spectra w.r.t. ISI index.

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THE MOORE-PENROSE INVERSE OF SYMMETRIC MATRICES WITH NONTRIVIAL EQUITABLE PARTITIONS

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ABSTRACT

In this paper we consider symmetric matrices that admit nontrivial equitable partitions. We determine some sufficient conditions for the quotient matrix of the Moore-Penrose inverse of the initial matrix to be equal to the Moore-Penrose inverse of its quotient matrix. We also study several particular cases when the computation of the Moore-Penrose inverse can be reduced significantly by establishing the formula for its computation based on the Moore-Penrose inverse of the quotient matrix. Among others we consider the adjacency matrix of a generalized weighted threshold graph.

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FUZZY OPTIMIZATION BY COVERING OF FUZZY GRAPHS AND ITS APPLICATION IN CCTV INSTALLATION

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ABSTRACT

In graph theory, a vertex covering set is a set of vertices such that each edge of the graph incident to at least one of the vertices of the set. The problems related to vertex covering are called vertex covering problems. Many real-life problems contain lot of uncertainties. To handle such uncertainties, concept of fuzzy graphs is used. Vertex covering problems of fuzzy graph are considered to model some real-life problems. In this article, a vertex covering problem is modelled as a cordon of programming problems. In this model, the following objectives are: (i) the total number of facilities, the coverage area and total efficiency of all facilities are maximized; and (ii) the total cost for the covering is minimized. Some new sets are defined to make best decision on the basis of the features of facilities of the fuzzy system. An illustration is given to describe the whole model. Application of the said vertex covering problem to make a suitable decision for the placement of CCTVs in a city with the help of the developed formulations are given in a systematic way. For solutions, some algorithms are designed and the mathematical software is used keeping the fuzziness of the parameters involved in the model.

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