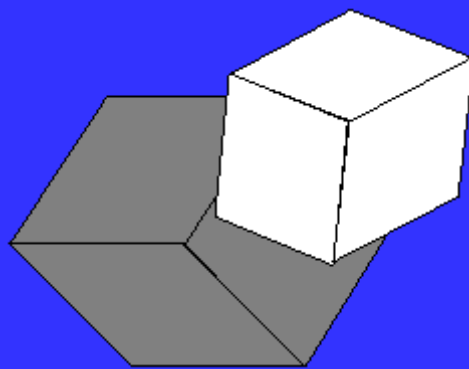


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Papers Abstracts



FORUM

SOME PROPERTIES OF AUTONILPOTENT GROUPS

Foroud Parvaneh

In this paper, we introduce the notion of autonilpotent groups and study the basic properties of this new notion. Among other results, it is shown that autonilpotency property is stronger than the usual nilpotency of groups. We also classify all finite abelian groups, which are autonilpotent. (pp. 1-8)

SEMIGROUP COMPACTIFICATION IN AN INTUITIONISTIC FUZZY CONVERGENCE TOPOLOGICAL SPACE

G.K. Revathi, E. Roja, M.K. Uma

The purpose of this paper is to discuss the problem of intuitionistic fuzzy lim semigroup compactification on intuitionistic fuzzy convergence topological semigroup and prove that the set of all intuitionistic fuzzy lim semigroup compactification of an intuitionistic fuzzy convergence topological semigroup is an upper complete semi Lattice. (pp. 9-22)

THE NONLOCAL BOUNDARY VALUE PROBLEMS FOR STRONGLY SINGULAR HIGHER-ORDER NONLINEAR FUNCTIONAL-DIFFERENTIAL EQUATIONS

Sulkhan Mukhigulashvili

A priori boundedness principle is proven for the nonlocal boundary value problems for strongly singular higher-order nonlinear functional-differential equations. Several sufficient conditions of solvability of the Dirichlet problem under consideration are derived from the a priori boundedness principle. The proof of the a priori boundedness principle is based on the Agarwal–Kiguradze type theorems, which guarantee the existence of the Fredholm property for strongly singular higher-order linear differential equations with argument deviations under the nonlocal boundary conditions. (pp. 23-50)

A COUPLED FIXED POINT THEOREM AND t -NORM OF HADŽIĆ TYPE IN FUZZY METRIC SPACE

Arihant Jain, V.K. Gupta, Abhishek Sharma, Dhansingh Bamniya

In this paper, we introduce a coupled fixed point theorem and t -Norm of Hadžić type in fuzzy metric space and we also give an application of our result. (pp. 51-60)

ON WEAKLY SS -QUASINORMAL SUBGROUPS OF FINITE GROUPS

Tao Zhao, Gangfu Lu, Chengjun Lv

Let H be a subgroup of a finite group G , then we say that H is weakly SS -quasinormal in G , if there exists a normal subgroup T of G such that HT is s -permutable and $H \cap T$ is SS -quasinormal in G . In this paper, we investigate the influence of some weakly SS -quasinormal subgroups on the structure of G . Some new criterias about the p -nilpotency and supersolubility of a finite group were obtained. We also generalized some known results about formations. (pp. 61-74)

\mathcal{I}_{g^*} -NORMAL AND \mathcal{I}_{g^*} -REGULAR SPACES

O. Ravi, M. Paranjothi, S. Murugesan, S. Padmasekaran

\mathcal{I}_{g^*} -normal and \mathcal{I}_{g^*} -regular spaces are introduced and various characterizations and properties are given. Characterizations of normal, mildly normal, g^* -normal and regular spaces are also given. (pp. 75-86)

SOME MEAN INEQUALITIES FOR POSITIVE LINEAR MAPS

Junjian Yang

If $m_1^2 \leq A \leq M_1^2 A$ and $m_2^2 \leq B \leq M_2^2 B$ for some positive real numbers $m_1 \leq M_1$, $m_2 \leq M_2$ and σ is a mean between geometric and arithmetic means, then for positive unital linear map Φ

$$\begin{aligned}\Phi\left(\frac{M_2 m_2}{M_1 m_1} A\right) \sigma \Phi(B) &\leq \frac{\frac{M_2}{m_1} + \frac{m_2}{M_1}}{2} \Phi(A \sigma B), \\ \Phi^{-\frac{1}{2}}(A \sigma B) \Phi(B) \Phi^{-\frac{1}{2}}(A \sigma B) - \Phi^{\frac{1}{2}}(A \sigma B) \Phi^{-1}(A) \Phi^{\frac{1}{2}}(A \sigma B) &\leq \left(\sqrt{\frac{M_2}{m_1}} - \sqrt{\frac{m_2}{M_1}}\right)^2, \\ \left(\frac{1}{M_1^2 m_1^2} \Phi(A)\right) \sigma \Phi(A^{-1}) &\leq \frac{M_1^2 + m_1^2}{2 M_1^2 m_1^2} \Phi(A \sigma A^{-1}).\end{aligned}$$

(pp. 87-90)

EQUITABLE COLORINGS OF CARTESIAN PRODUCTS OF FANS WITH BIPARTITE GRAPHS

Liancui Zuo, Fanglan Wu, Shaoqiang Zhang

In this paper, by the sorting method of vertices, it is obtained that the equitable chromatic number and the equitable chromatic threshold of the Cartesian products of fans with bipartite graphs. (pp. 91-100)

VERTEX-TO-EDGE CENTERS W.R.T. D -DISTANCE

D. Reddy Babu, P.L.N. Varma

Between any two vertices of a graph we can define many distances, the usual distance, detour distance, superior distance, signal distance, degree distance etc. In some of these distances only the lengths of various paths were considered. By considering the degrees of various vertices present in a path, in addition to the length of the path, in an earlier article we introduced the concept of D -distance, $d^D(u, v)$, in graphs. In this article we study D -distance between a vertex and an edge of a graph and determine the eccentricities, radius and diameters of some classes of graphs. We also obtain relations between their eccentricities and also determine centers of graphs. Further, we prove that for any graph G either $C^D(G) \subseteq C_1^D(G)$ or $C_1^D(G) \subseteq C^D(G)$. (pp. 101-8)

PRIME IDEALS IN RIGHT TERNARY NEAR-RINGS AND RIGHT TERNARY N -GROUPS

A. Uma Maheswari, C. Meera

A Right Ternary Near-Ring (RTNR) is an algebraic system which is a group under binary addition and a ternary semigroup under ternary multiplication satisfying the right distributive law. In this paper ν -prime ideals where $\nu \in \{0, 1, 2, 3\}$ and equiprime ideals of an RTNR are defined and the relationship among them are discussed. A comparison between ν -primitive ideals and ν -prime ideals where $\nu \in \{0, 1, 2\}$ is given. If N is an RTNR then ν -prime ideals where $\nu \in \{0, 1, 2, 3, e, c\}$ in right ternary N -groups are defined and their relationships are studied. If Δ is an ideal of a right-lateral ternary N -group Γ , then the interrelationship between the ideal $(\Delta : \Gamma)$ of N and Δ are obtained. If $\nu = 0, 1, 2, 3, c$ then ν -semiprime ideals in RTNR and right ternary N -groups are also studied. (pp. 109-128)

$\alpha A_{\mathcal{I}}^*$ -SETS, $\alpha C_{\mathcal{I}}$ -SETS, $\alpha C_{\mathcal{I}}^*$ -SETS AND DECOMPOSITIONS OF α - \mathcal{I} -CONTINUITY

O. Ravi, V. Rajendran, K. Indirani, S. Vijaya

The aim of this paper is to introduce and study the notions of $\alpha A_{\mathcal{I}}^*$ -sets, $\alpha C_{\mathcal{I}}$ -sets and $\alpha C_{\mathcal{I}}^*$ -sets in ideal topological spaces. Properties of $\alpha A_{\mathcal{I}}^*$ -sets, $\alpha C_{\mathcal{I}}$ -sets and $\alpha C_{\mathcal{I}}^*$ -sets are investigated. Moreover, decompositions of α - \mathcal{I} -continuous functions and decompositions of $\alpha A_{\mathcal{I}}^*$ -continuous functions via $\alpha A_{\mathcal{I}}^*$ -sets, $\alpha C_{\mathcal{I}}$ -sets and $\alpha C_{\mathcal{I}}^*$ -sets in ideal topological spaces are established. (pp. 129-142)

APPROXIMATE SOLUTION OF CONVECTION-DIFFUSION EQUATIONS USING A HAAR WAVELET METHOD

Inderdeep Singh, Sheo Kumar

We present here a Haar wavelet method for numerical solution of convection-diffusion equations. Haar wavelet is a powerful mathematical tool used to solve various type of partial differential equations. The solutions obtained by Haar wavelet are more accurate and efficient. (pp. 143-154)

MINIMAL INTUITIONISTIC GENERAL L -FUZZY AUTOMATA

M. Shamsizadeh, M.M. Zahedi

In this paper we present an intuitionistic general L -fuzzy automaton (IGLFA) based on lattice valued intuitionistic fuzzy sets [2]. In this note, we define (α, β) -language, (α, β) -complete, (α, β) -accessible, (α, β) -reduced for an IGLFA over a bounded complete lattice L , where $\alpha, \beta \in L$ and $\alpha \leq_L N(\beta)$. In particular, we prove a theorem which is generalization of Myhill-Nerode theorem in ordinary deterministic automata. In other words for any recognizable (α, β) -language over a bounded complete lattice L , there exist minimal (α, β) -complete and deterministic IGLFA, which preserve (α, β) -language, where $\alpha, \beta \in L$ and $\alpha \leq_L N(\beta)$. Also, we show that for any given (α, β) -language \mathcal{L} , the minimal (α, β) -complete and deterministic IGLFA recognizing \mathcal{L} is isomorphic with threshold (α, β) to any (α, β) -complete, (α, β) -accessible, deterministic, (α, β) -reduced IGLFA recognizing \mathcal{L} . Moreover, we give some examples to clarify these notions. Finally, by using these notions, we give some theorems and obtain some results. (pp. 155-186)

RECOGNIZING CHEVALLEY GROUPS $G_2(q)$ BY nse

Shitian Liu, Zhanghua Zhang

Let $G_2(q)$ be a Chevalley group over a finite field $K = F_q$ of characteristic p . For a group G , let $\text{nse}(G) = \{s_k | k \in \omega(G)\}$ where $\omega(G)$ is the set of element orders of G and s_k is the number of elements of order k in G . In this note, we give a new characterization of some special Chevalley groups $G_2(q)$ by nse. (pp. 187-198)

MORE ON UPPER AND LOWER FAINTLY ω -CONTINUOUS MULTIFUNCTIONS

Carlos Carpintero, Jackeline Pacheco, Namegalesh Rajesh, Ennis Rosas

The aim of this paper is to find under what minimal conditions the class of faintly ω -continuous multifunctions and the class of ω -continuous multifunctions agree. Similarly, we investigate when the class of faintly ω -continuous multifunctions and the class of faintly continuous multifunctions are the same. (pp. 199-206)

SEMIGROUP IDEALS AND PERMUTING 3-GENERALIZED DERIVATIONS IN PRIME NEAR RINGS

Asma Ali, Mehsin Jabel Atteya, Phool Miyan, Farhat Ali

The purpose of the present paper is to prove some commutativity theorems in the setting of a semigroup ideal of a 3-prime near ring admitting a permuting generalized 3-derivation, thereby extending some known results of derivations, biderivations and 3-derivations. (pp. 207-226)

NOTES ON THE ARITHMETIC-GEOMETRIC MEAN INEQUALITY FOR SINGULAR VALUES

Jiechang Ruan

In this short note, we present a generalization and a new equivalent form of the arithmetic-geometric mean inequality for singular values. Meanwhile, we also show some remarks related to generalizations of the arithmetic-geometric mean inequality for singular values. (pp. 227-232)

ON STRONG AND WEAK HYPER KS-IDEALS OF DECOMPOSABLE HYPER KS-SEMIGROUPS

Georgie F. Tabaranza, Jocelyn P. Vilela

This paper extends the study of hyper KS-semigroups, an algebraic hyperstructure which is a combination of hyper BCK-algebra and semihypergroups with respect to some hyperoperations to the concept of decomposable hyper KS-semigroups. We introduce the concept of strong and weak hyper KS-ideals and present some of their properties. Furthermore, we establish the idea of decomposable hyper KS-semigroups in the context of strong, weak and hyper KS-ideals, give conditions for decomposable hyper KS-semigroups, investigate its properties and structure and provide some characterizations.

(pp. 233-242)

MORE ON KRASNER (m, n) -HYPERRINGS

Jinyan Wang, Jingli Wu, Zhixin Li

In this paper, we introduce (idealistic) soft Krasner (m, n) -hyperrings based on the soft set theory, and derive three isomorphism theorems of soft Krasner (m, n) -hyperrings. Furthermore, we consider T -fuzzy hyperideals and falling fuzzy hyperideals of Krasner (m, n) -hyperrings by using triangular norms and the theory of falling shadows, respectively, and discuss the relationships among idealistic soft Krasner (m, n) -hyperrings, fuzzy hyperideals, T -fuzzy hyperideals and falling fuzzy hyperideals.

(pp. 243-264)

EXTENSIONS OF GENERALIZED LIE GROUPS IN TERMS OF COHOMOLOGY

A.R. Armakan, S. Merati, M.R. Farhangdoost

In this paper we introduce cohomology of generalized Lie groups, explain the problem of generalized Lie group extensions and present them in terms of cohomology of generalized Lie groups. Moreover we find a cohomological obstruction to the existence of extensions in non-Abelian case.

(pp. 265-276)

THE WIGNER-POISSON-FOKKER-PLANCK SYSTEM WITH EXCHANGE POTENTIAL IN WEIGHTED L^2 SPACE

Bin Li, Jie-Qiong Shen

This paper is concerned with the Wigner-Poisson-Fokker-Planck(WPFP) system subject to Coulomb and exchange potential. In this work, existence and uniqueness of the local mild solution are established on an appropriately weighted- L^2 space in one dimension. The main difficulties in establishing mild solution are to derive a-priori estimates on the appropriate potential term. The proof is based on contraction mapping principle and parabolic regularization of the quantum Fokker-Planck term.

(pp. 277-292)

ON CONVEXITY OF FUZZY MAPPINGS AND FUZZY OPTIMIZATIONS

Dong Qiu, Hua Li

In this paper, based on a new order and a new metric on the set of fuzzy numbers, we present the concepts of convexity of the fuzzy mappings and give characterization theorems for the convex fuzzy mappings and quasi-convex fuzzy mappings. Finally, we discuss the properties of convex fuzzy optimizations.

(pp. 293-304)

AN EFFICIENT ALGORITHM FOR WIDTHS OF CHANNEL ROUTING WITH GIVEN HORIZONTAL CONSTRAINT GRAPH

Xianya Geng, Xianwen Fang, Dequan Li, Jing Chu

In VLSI design, One of the most important detailed routings is the channel routing. Channel routing in the 2-layer Manhattan model is one of the most investigated problem in VLSI design. In this paper, we consider the channel with horizontal constraint graph is a star. An efficient graph theoretic algorithm is presented, compared with the latest results, our algorithm yields a better bound on the width of the channel. (pp. 305-310)

COMPOSITE TRAPEZOID RULE FOR THE RIEMANN-STIELTJES INTEGRAL AND ITS RICHARDSON EXTRAPOLATION FORMULA

Weijing Zhao, Zhaoning Zhang, Zhijian Ye

In this paper, the composite trapezoid rule for the Riemann-Stieltjes integrals is presented and its error is investigated. And then, the rationality of the generalization of composite trapezoid rule for Riemann-Stieltjes integral is demonstrated. At last, Richardson extrapolation is applied to the composite trapezoid rule for the Riemann-Stieltjes integral to obtain high accuracy approximations with little computational cost. (pp. 311-318)

RELATIVE ENTROPY AND RELATIVE CONDITIONAL ENTROPY WITH INFINITE PARTITIONS

Mohamad Hosein Asadiyan, Abolfazl Ebrahimzadeh

In this paper, we introduce the notions of relative entropy and relative conditional entropy for infinite partitions on a relative probability measure space. We present some examples and prove some theorems about relative conditional entropy. (pp. 319-326)

A GENERALIZATION OF SIMPSON TYPE INEQUALITY VIA DIFFERENTIABLE FUNCTIONS USING (s, m) -CONVEX FUNCTIONS

Zhiqiao Yang, Yujiao Li, Tingsong Du

We derive a differentiable mapping integral identity, which is involved with two parameters. By using this result, we establish new inequalities of Simpson type based on (s, m) -convexity for differentiable mappings. This contributes to new better estimates than the earlier results. Finally, some applications to special means of positive real numbers have also been presented. (pp. 327-338)

T_1 CONCEPTS IN FUZZY BITOPOLOGICAL SPACES

Ruhul Amin, Dewan Muslim Ali, Sahadat Hossain

In this paper, we introduce some notions of fuzzy pairwise- T_1 bitopological spaces and find relations among them. We also study some other properties of these concepts. (pp. 339-346)

A NOTE ON SINGULAR VALUE INEQUALITIES FOR COMPACT OPERATORS

Yanqiu Wu, Yang Peng

In this short note, we present some singular value inequalities for compact operators. Our results are generalizations of ones obtained by Audeh and Kittaneh [Linear Algebra Appl., 437 (2012), 2516-2522]. (pp. 347-350)

ON SOME PROPERTIES OF M -HYPERCYCLIC C_0 -SEMIGROUP

Abdelaziz Tajmouati, Abdeslam El Bakkali, Ahmed Toukmati

In this article, we justify that every separable infinite dimensional complex Banach space admits an M -hypercyclic C_0 -semigroups. Also, we prove that if $(T_t)_{t \geq 0}$ is an M -hypercyclic C_0 - semigroup of a generator A acting on such X then the point spectrum $\sigma_p(T_t^*)$ may be empty or not. On other hand we introduce the concept of diskcyclic, M -diskcyclic and M -disk transitive C_0 -semigroup; we obtain some proprieties as well as an important characterization for these notions. (pp. 351-360)

TWO RESULTS ON THE ABELIAN IDEALS OF A BOREL SUBALGEBRA

Qian Zhan

Let \mathfrak{b} a fixed Borel subalgebra of a finite-dimensional complex simple Lie algebra \mathfrak{g} . The Shi bijection associates to every ad-nilpotent ideal \mathfrak{i} of \mathfrak{b} a region $V_{\mathfrak{i}}$. In this paper, we show that \mathfrak{i} is abelian if and only if $V_{\mathfrak{i}} \cap 2A$ is nonempty, if and only if the volume of $V_{\mathfrak{i}} \cap 2A$ equals to that of A , where A is the fundamental alcove of the affine Weyl group. We also determine the maximal eigenvalue m_{r-1} of the Casimir operator on $\Lambda^{r-1}\mathfrak{g}$ and the corresponding eigenspace M_{r-1} , where r is the number of positive roots. (pp. 361-368)

OPTIMAL INVESTMENT DECISION USING NEURAL REDUCT FUZZY SET OF IVFS

M. Muthumeenakshi, P. Muralikrishna

Taking optimal investment decision is very challenging in the current scenario. Traditionally, the investors were followed fundamental analysis or technical analysis in the investment decision. But, today the market and technology are growing very faster than the investors' ideas. Every new method is coming for the investment analysis. All the decisions are future oriented which relies uncertainty. It is inevitable to apply a tool which is linked with the uncertainty. Hence, in this study, 'IVFS' technique has been used which measures the uncertainty. Finding out the exact membership in Interval Valued Fuzzy is a crucial part in the investment analysis. To reduce this problem, here the notion of neural reduct fuzzy set of interval valued fuzzy set has been applied. In a clear sense, this paper finds the membership using interval value and converge into one single point that act as member for the fuzzy set. (pp. 369-372)

ON THE EXCHANGE PROPERTY FOR THE HARTLEY TRANSFORM

Abhishek Singh

In this paper we investigate the exchange property for the Hartley transform by using the relation between the Fourier transform and the Hartley transform. Simplified construction of tempered Boehmians is also presented. (pp. 373-380)

MULTIPLIERS ON SPACES OF VECTOR VALUED ENTIRE DIRICHLET SERIES OF TWO COMPLEX VARIABLES

Akanksha, G.S. Srivastava

In this paper, we study a class of sequence spaces defined by using the type of an entire function represented by vector valued Dirichlet series of two complex variables. The main results concern with obtaining the nature of the dual spaces of this sequence space and coefficient multipliers for some classes of vector valued Dirichlet series. (pp. 381-388)

MULTIPLICATION COMPONENTS OF GRADED MODULES

Rashid Abu-Dawwas

Let G be a group and $g \in G$. Let R be a commutative G -graded ring and M be a graded R -module. In this paper, we study some cases when R is strongly graded ring and the component M_e of M is multiplication R_e -module. Also, we prove that if R is strongly graded, then the components M_g of M are multiplication R_e -modules if and only if the component M_e is P -torsion or P -cyclic where P is a prime ideal of the component R_e of R . (pp. 389-392)

GENERALIZED CUBIC SOFT SETS AND THEIR APPLICATIONS TO ALGEBRAIC STRUCTURES

Asad Ali, Young Bae Jun, Madad Khan, Fu-Gui Shi, Saima Anis

In this paper, we introduce the concepts of generalized cubic soft sets, generalized cubic soft \mathcal{AG} -subgroupoids and generalized cubic soft left (resp., right) ideals to study the algebraic structures and properties of \mathcal{AG} -groupoids. We also give some examples of generalized cubic soft \mathcal{AG} -subgroupoids and generalized cubic soft left (resp., right) ideals. Moreover, we characterize intra-regular \mathcal{AG} -groupoids using the properties of generalized cubic soft sets and generalized cubic soft right ideals. (pp. 393-414)

CHARACTERIZATIONS OF ORDERED \mathcal{AG} -GROUPOIDS IN TERMS OF SOFT SETS

Asad Ali, Fu-Gui Shi, Madad Khan

We introduced the concepts of soft intersection left (right, two-sided) ideals, (generalized) bi-ideals, interior ideals, quasi-ideals in ordered \mathcal{AG} -groupoids and obtained significant characterizations of intra-regular ordered \mathcal{AG} -groupoid via soft intersection left (right, two-sided) ideals, (generalized) bi-ideals, interior ideals, quasi-ideals of ordered \mathcal{AG} -groupoids. (pp. 415-432)

SOME GENERAL NUMERICAL RADIUS INEQUALITIES FOR THE OFF-DIAGONAL PARTS OF 2×2 OPERATOR MATRICES

Watheq Bani-Domi

We give some sharp inequalities involving powers of the numerical radii for the off-diagonal parts of 2×2 operator matrices. These inequalities, which are based on some classical convexity inequalities for the nonnegative real numbers, generalize earlier numerical radius inequalities. (pp. 433-442)

ON ROUGH APPROXIMATIONS OF SUBGROUPS VIA CONJUGACY

V. Srinivasa kumar, Y. Madhavi Reddy

Conjugacy is a very significant equivalence relation in the theory of groups and it has several important applications as well. In this present paper, we use this equivalence relation to generate Rough sets. A few results are presented in this context by assigning a group structure to the universe set. Some interesting properties of Lower and Upper approximations of subgroups are investigated. (pp. 443-452)

EXISTENCE AND UNIQUENESS OF Ψ -BOUNDED SOLUTIONS FOR NONLINEAR MATRIX DIFFERENCE EQUATIONS

T. Srinivasa Rao, G. Suresh Kumar, Ch. Vasavi, M.S.N. Murty

Sufficient conditions are established for the existence and uniqueness of Ψ -bounded solutions for nonlinear vector difference equation on \mathbb{Z} , using Banach contraction principle. Further, we obtain sufficient conditions for the existence and uniqueness of Ψ -bounded solutions for nonlinear matrix difference equation on \mathbb{Z} , using Kronecker product of matrices. (pp. 453-464)

ON RADIAL DISTRIBUTION OF JULIA SETS OF SOLUTIONS TO COMPLEX DIFFERENTIAL EQUATIONS WITH MEROMORPHIC COEFFICIENTS

Guowei Zhang

In this paper, we mainly investigate the radial distribution of Julia set of solutions to some second order complex linear differential equations with meromorphic coefficients, and find out the lower bound of it. The radial distributions of Julia sets of derivatives of these solutions are also obtained. (pp. 465-476)

EXTENSION OF MITTAG–LEFFLER DENSITY AND PROCESSES

P.V. Shah, S.J. Rapeli, M.P. Singh, A.K. Shukla

An attempt is made to investigate some properties of Mittag-Leffler density. In this paper, structural representation of the Mittag–Leffler variable and extension of Mittag–Leffler stochastic process have also been discussed. (pp. 477-486)

SOME RESULTS ON HYPERCYCLICITY OF TUPLE OF OPERATORS

Abdelaziz Tajmouati, Mohammed El berrag

In this paper we extend some results of hypercyclicity from a single operator to a tuple of commuting operators. In particular we extend theorem of Nathan S. Feldman to a tuple of commuting operators. (pp. 487-492)

BI-HYPERIDEALS AND QUASI-HYPERIDEALS IN ORDERED SEMIHYPERGROUPS

Thawhat Changphas, Bijan Davvaz

In this paper, we introduce concepts of bi-hyperideals and quasi-hyperideals of an ordered semihypergroup and present several examples of them. Some properties and relationships between bi-hyperideals and quasi-hyperideals are investigated. In particular, we introduce the concept of intra-regular ordered semihypergroups and give their characterizations in terms of bi-hyperideals and quasi-hyperideals. (pp. 493-508)

FILTER THEORY ON HYPER BE-ALGEBRAS

Xiao Yun Cheng, Xiao Long Xin

In this paper, we focus on investigating some types of hyper filters on hyper BE-algebras and discuss the relations among them. Also we construct quotient hyper BE-algebras and deliver some related results. (pp. 509-526)

A CLASS OF HIGH ACCURACY EXPLICIT DIFFERENCE SCHEMES FOR SOLVING THREE-DIMENSIONAL PARABOLIC EQUATIONS

Yongqiang Zhan, Jinlan Guan

A class of explicit difference schemes with high accuracy for solving three-dimensional parabolic equations are given. First, a difference approximation expression of $\frac{\partial u}{\partial t}$ is deduced at a special node (x_j, y_k, z_l, t_{n+1}) ; a class of explicit difference schemes are constructed by the method of undetermined coefficients, and appropriate parameters are chosen to endow the truncation error of schemes is $O(\Delta t^3 + \Delta x^4)$. In turn, the new difference schemes are proved to be stable if $r < \frac{1}{4}$ with the Fourier analysis method. Finally, the numerical experiment shows the numerical solutions of difference schemes and the exact solutions are matched and the difference schemes are effective. (pp. 527-536)

HESITANT FUZZY IDEALS IN ABEL-GRASSMANN'S GROUPOIDS

Asad Ali, Madad Khan, Fu-Gui Shi

In this paper, we introduced the concepts of hesitant fuzzy sets, hesitant fuzzy product, characteristic hesitant fuzzy set, hesitant fuzzy \mathcal{AG} -groupoids, hesitant fuzzy left (resp., right, two-sided) ideal, hesitant fuzzy bi-ideal, hesitant fuzzy interior ideal and hesitant fuzzy quasi-ideal in \mathcal{AG} -groupoids, their examples and basic properties are given. We also characterized regular, completely regular, weakly regular and quasi-regular \mathcal{AG} -groupoid by the properties of their hesitant fuzzy ideals. (pp. 537-556)

FIXED POINTS IN INTUITIONISTIC MENGER SPACE

Arihant Jain, V.K. Gupta, Ramesh Bhinde

The purpose of this paper is to use the new concept of absorbing mappings in intuitionistic Menger space and prove fixed point theorems, without appeal to continuity. The results thus obtained, generalizes and extends the result of Rashwan and Hedar [5] in intuitionistic Menger space. We also cited an example in support of our result. (pp. 557-568)

THE INDEX OF A SPECIAL BIPARTITE GRAPH

Jing Chu, Feng Xu, Xiaona Zhou

The Harary index of a graph is defined as the sum of reciprocals of distances between all pairs of vertices of the graph. In this paper we provide an upper bound of the Harary index in the class of all connected n -vertex bipartite graphs with a given matching number q . We characterize the unique graph with the maximum Harary index in the class of all connected n -vertex bipartite graphs with a given matching number q . (pp. 569-574)

CENTRALIZERS ON PRIME AND SEMIPRIME GAMMA RINGS

Md Fazlul Hoque, A.C. Paul

Let M be a noncommutative 2-torsion free semiprime Γ -ring satisfying a certain assumption and let S and T be left centralizers on M . We prove the following results:

- (i) If $[S(x), T(x)]_\alpha \beta S(x) + S(x) \beta [S(x), T(x)]_\alpha = 0$ holds for all $x \in M$ and $\alpha, \beta \in \Gamma$, then $[S(x), T(x)]_\alpha = 0$.
- (ii) If $S \neq 0 (T \neq 0)$, then there exists $\lambda \in C$, (the extended centroid of M) such that $T = \lambda \alpha S$ ($S = \lambda \alpha T$) for all $\alpha \in \Gamma$.
- (iii) Suppose that $[[S(x), T(x)]_\alpha, S(x)]_\beta = 0$ holds for all $x \in M$ and $\alpha, \beta \in \Gamma$. Then $[S(x), T(x)]_\alpha = 0$ for all $x \in M$ and $\alpha \in \Gamma$.
- (iv) If M is a prime Γ -ring satisfying a certain assumption and $S \neq 0 (T \neq 0)$, then there exists $\lambda \in C$, the extended centroid, such that $T = \lambda \alpha S (S = \lambda \alpha T)$. (pp. 575-586)

A NOTE ON SPECIAL MATRICES

Roselin Antony, Habtu Alemayehu

The word "matrix" comes from the Latin word for "womb" because of the way that the matrix acts as a womb for the data that it holds. The first known example of the use matrices was found in a Chinese text called Nine Chapters of the Mathematical Art, which is thought to have originated somewhere between 300 B.C. and 200 A.D. The modern method of matrix solution was developed by a German mathematician and scientist Carl Friedrich Gauss. There are many different types of matrices used in different modern career fields. We introduce and discuss the different types of matrices that play important roles in various fields. (pp. 587-604)

FUZZY ISOMORPHISM THEOREMS OF SOFT GROUPS

Wenjun Pan, Qiumei Wang, Jianming Zhan

In this paper, we introduce the concept of fuzzy normal subgroups of soft groups. The first, second and third fuzzy isomorphism theorems of soft groups are established, respectively. In particular, some classes of quotient groups are characterized by their fuzzy normal subgroups. (pp. 605-616)

CERTAIN TRANSFORMATIONS OF BASIC AND POLY-BASIC HYPERGEOMETRIC SERIES

S. Ahmad Ali, S. Nadeem Hasan Rizvi

In the present work, certain new transformations of basic and poly-basic hypergeometric series have been established with the help of Bailey lemma. (pp. 617-624)

CLEAN MULTIPLICATIVE HYPERRINGS

R. Ameri, A. Kordi

In this work, we introduce the notation of clean multiplicative hyperrings and we will obtain some properties of them. Also we study some topological concepts to prove some results on clean elements of multiplicative hyperrings. (pp. 625-636)

A FAMILY OF NONBINARY SEQUENCES WITH OPTIMAL CORRELATION PROPERTY

Xinjiao Chen

In this paper, we first present a family of p -ary sequences with ideal two-level autocorrelation property, which could be regarded as a generalization of the well-known nonbinary sequences introduced by Helleseth and Gong. Utilizing the proposed sequences and m -sequences, we later construct a family of p -ary sequences of which the correlation property is optimal in terms of the Welch lower bound. (pp. 637-648)

CONNECTEDNESS IN INTUITIONISTIC FUZZY TOPOLOGICAL SPACES IN ŠOSTAK'S SENSE

A.A. Abd El-Latif, Mohammed M. Khalaf

In this paper, we introduce various types of fuzzy connectedness in intuitionistic fuzzy topological spaces in view of Šostak's sense. The interrelationship between different notions of intuitionistic fuzzy connectedness are investigate. Also, we inspect some interrelations between these types of intuitionistic fuzzy connectedness together with the preservation properties under intuitionistic fuzzy continuous maps. (pp. 649-668)

ON SOME MORE q -SERIES IDENTITIES

S.N. Singh, Satya Prakash Singh

In this paper we have discussed and also generalized some interesting identities found in the 'Lost' notebook of Ramanujan. (pp. 669-676)

ENDOGENOUS CONTROL IN A TERNARY LOTKA-VOLTERRA MODEL AND ITS APPLICATIONS

Livio Clemente Piccinini, Maria Antonietta Lepellere, Ting Fa Margherita Chang, Luca Iseppi

This paper aims at highlighting the role of endogenous controls in Lotka-Volterra predator-prey models. Unlike other studies in which the core lies in expanding the number of conflicting species, here the stress is laid upon a control variable that does not need to be of the same nature as the species involved in the conflict. As in the case of the logistic equation Lotka-Volterra models have proved highly fruitful also outside the pure biological frame, clarifying many socio-economical and psychological evolution phenomena. A main problem lies in the change of the structural parameters, that can alter the evolution. Rather than an exterior action a model is most satisfactory in presence of an endogenous change, that should happen without any external intervention. The critical model is described in Section 2 under the name of tripartite antagonist model, where there are three actors, and three predator-prey equations involving, two at each time, the actors. The structure is that each actor once is predator and once prey in a circular scheme. In some natural cases the three variables are all biological, but in most meaningful cases the control has a different nature, usually social or behavioral. The paper highlights the particular case where the initial existence of a control, albeit at a very low level, is essential to allow the development towards equilibrium, while its absence leads to the destruction of the prey. A similar case arises when predator and prey are in temporary equilibrium, but a hidden control variable operates until a sudden change of equilibrium bursts out. Section 1 is devoted to recall some preliminary knowledge of system theory and of Lotka-Volterra classical equations. Section 3 is devoted to illustrate some actual cases where tripartite antagonist system can explain social, psychological, economic developments, even with reference to the academic world. The long lasting competition between Stoicism and Epicurism, between hedonism and Aristotle's eudaimonia fully enters in this scheme. (pp. 677-704)

GLOBAL ASYMPTOTIC STABILITY FOR A STOCHASTIC COMPETITION AND COOPERATION MODEL OF TWO ENTERPRISES

Changjin Xu, Maoxin Liao

This paper deals with a stochastic competition and cooperation model of two enterprises. Some very verifiable criteria on the global stability of the positive equilibrium of the deterministic system are established. An example with its computer simulations is given to illustrate our main theoretical findings. (pp. 705-716)