Indian Journal of Mathematics
Dharma Prakash Gupta Memorial Volume
Volume 60, No. 2, 2018

CONTENTS

Abstract: It is well known that using zeta-function regularization, the regularized products over all positive integers and over all primes can be calculated. In the present study, we evaluate the regularized products over balancing and Lucas-balancing numbers using the notion of zeta-function regularization.

Abstract: In this paper, we have defined Lagrangian function in rational form which completely describes generalized modified Emden type equation. First integrals of generalized modified Emden type equation are obtained with the help of Noether's theorem. These first integrals are integrated by using Lie point symmetries.

Abstract: In the present work a class of abstract integral equations of second kind with two nonlinear Volterra type operators is considered. Sufficient conditions for the existence and uniqueness of the solutions of this class integral equations are obtained. The corresponding integral inequalities are studied too and some applications of the obtained results to integral inequalities involving maxima are given.

Abstract: In this paper, we have focused on uniqueness results when certain types of differential-difference polynomials of finite order share a small function under relaxed sharing hypotheses. The results improve a number of existing results and rectify some gaps and errors in [21].

Abstract: In this paper, we study the growth of analytic matrix functions and introduce their (q)-order and (q)-type. We also obtain the coefficient characterizations for these growth parameters, independently of the scalar analytic function of two complex variables associated with it.

Abstract: A Roman dominating function (RD-function) on a graph $G = (V(G), E(G))$ is a labeling $f : V(G) \longrightarrow \{0, 1, 2\}$ such that every vertex with label 0 has a neighbor with label 2. The weight $f(V(G))$ of a RD-function f on G is the value $\Sigma_{v \in V(G)} f(v)$. The *Roman domination number* $\gamma_R(G)$ of G is the minimum weight of a RD-function on G.

The γ_R-graph of a graph G, is any graph which vertex set is the collection $\mathscr{D}_R(G)$ of all minimum weight RD-functions on G. We define adjacency between any two elements of $\mathscr{D}_R(G)$ in several ways, and initiate the study of the obtained γ_R-graphs.

Abstract: In this paper, we define the notion of a filter in a matroid and analogous to the idea of a base for a matroid, we introduce the idea of a filterbase. We study properties of matroid filterbases, gathering points and convergence of filterbases. We characterize bimatroids and the closure operation of a matroid in terms of filterbases.

Abstract: In this article, we study the controllability of finite-dimensional dynamical control systems modeled by fractional order $\alpha \in (0, 1)$ semilinear autonomous differential equations with a constant time delay in control function. Initially, we derive a necessary and sufficient condition for the controllability of the corresponding linear fractional order delay system. Then under the assumption of boundedness of nonlinearities, we prove

that the actual system is also controllable by employing Schauder fixed point theorem. An example is given to illustrate the theoretical results.

B. Ungor, H. Kose, Y. Kurtulmaz and A. Harmanci
A NIL APPROACH TO SYMMETRICITY OF RINGS 337-357

Abstract: We introduce a weakly symmetric ring which is a generalization of a symmetric ring and a strengthening of both a GWS ring and a weakly reversible ring, and investigate properties of the class of this kind of rings. A ring R is called *weakly symmetric* if for any a, b, $c \in R$, abc being nilpotent implies that $Racrb$ is a nil left ideal of R for each $r \in R$. Examples are given to show that weakly symmetric rings need to be neither semicommutative nor symmetric. It is proved that the class of weakly symmetric rings lies also between those of 2-primal rings and directly finite rings. We show that for a nil ideal I of a ring R, R is weakly symmetric if and only if R/I is weakly symmetric. If $R[x]$ is weakly symmetric, then R is weakly symmetric, and $R[x]$ is weakly symmetric if and only if $R[x; x^{-1}]$ is weakly symmetric. We prove that a weakly symmetric ring which satisfies Köthe's conjecture is exactly an NI ring. We also deal with some extensions of weakly symmetric rings such as a Nagata extension, a Dorroh extension.

****