CONTENTS

Abstract: The concept of Γ-semihyperrings is a generalization of semihyperrings, a generalization of Γ-semirings and a generalization of semirings. In this paper, we continue our previous works on this algebraic hyperstructure. We introduce the notion of complex product of Γ-semihyperrings, and then we obtain some results in this respect.

Abstract: In this paper, we define a new class of univalent functions defined in the open unit disc associated with Dziok-Srivastava operator. We obtain some results including coefficient inequality, Hölder inequalities and modified Hadamard products for functions in this class.

S. Ray and A. Garai

ON HIGHER ORDER LAPLACE SMOOTH FUNCTIONS   153-172

Abstract: Let a function $f : \mathbb{R} \longrightarrow \mathbb{R}$ be integrable in some neighbourhood of $x \in \mathbb{R}$. If there are real numbers $\alpha_0, \alpha_2, \ldots, \alpha_{2k-2}$ such that

$$\lim_{s \to \infty} s^{2k-1} \int_0^\delta e^{-st} \left[\frac{f(x+t) + f(x-t)}{2} - \sum_{i=0}^{k-1} \frac{t^{2i}}{(2i)!} \alpha_{2i} \right] dt = 0,$$

for some $\delta > 0$, then α_{2k-2} is called the symmetric Laplace derivative of f at x of order $2k - 2$ and is denoted by $SLD^{2k-2} f(x)$. If $SLD^{2k-2} f(x)$ exists, then f is said to be Laplace smooth at x of order $2k$ if

$$\lim_{s \to \infty} s^{2k} \int_0^\delta e^{-st} \left[\frac{f(x+t) + f(x-t)}{2} - \sum_{i=0}^{k-1} \frac{t^{2i}}{(2i)!} SLD^{2i} f(x) \right] dt = 0.$$

There is a corresponding definition of Laplace smooth of order $(2k + 1)$. It is shown that Laplace smooth is more general than ordinary smooth. Some properties of Laplace smooth functions are studied here.

Vikas S. Jadhav and Rahul Dattatraya Kitture

z-CLASSES IN p-GROUPS OF ORDER $\leq p^5$ 173-194

Abstract: For a group G, we say that $x, y \in G$ are in the same z-class, if their centralizers in G are conjugate. The *notion of dynamical types* in classical geometries is closely related to the *notion of z-classes* of elements in the automorphism groups of the geometries. Classifying the z-classes in a group is a problem of independent interest as well, and is considered by many authors, recently, for groups with more structure on the underlying set. In this paper, we show that any non-abelian group of order p^3 or p^4 has exactly $p + 2$ z-classes. Also, we determine the number of z-classes in p-groups of order p^5.

Khem Chand and Bharti Sharma

Effects of heat and mass transfer on MHD free convective flow through porous medium with viscous dissipation   195-215

Abstract: In this analysis, a mathematical model is presented for an unsteady free convective flow of a viscous incompressible and electrically conducting fluid past an infinite vertical porous plate in the presence of a unifom magnetic field. The governing equation are solved by the method of perturbation technique and the expression for velocity, temperature and concentration have been obtain. The non-dimensional governing equations are converted in to ordinary differential equations and solved . The results for the velocity, temperature and concentration are evaluated numerically and displayed graphically. The effect of various parameters entering in the governing equations on skin friction coefficient, the rate of heat and mass transfer have been presented graphically and discussed. It has been observed that the velocity increases with the increase of the Grashoff number and porosity parameter, whereas it decreases as the magnetic field parameter increases. Concentration decrease with the increase in the chemical reaction parameter and there is a decrease in temperature with the increase in radiation parameter.

****