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CONTENTS

Abstract: In this study, we obtain a spinorial Gauss formula for a lightlike hypersurface in Lorentzian manifold with 4-dimension. Then, considering the degenerate metric on hypersurface, we investigate Dirac operator for lightlike hypersurface. Later, we establish the relation between Dirac operators and Riemannian curvatures of manifold and hypersurface.

Abstract: In this article, we study the structure of a near-ring N admitting a Jordan ideal J satisfying J^2 included in Z(N). In addition, we study the behavior of derivations verifying certain differential identities on Jordan ideals and on semigroup ideals of N. Some of our results extend earlier results involving similar conditions on the entire near-ring. Furthermore, two examples proving the necessity of the 3-primeness assumed in the hypotheses of our theorems cannot be neglected.

Abstract: In this article we continue the research on the smooth Picard singular integral operators that started in [2], see there chapters [10]-[14]. This time the foundation of our research is a parametrized trigonometric Taylor's formula. We establish the Lp, $p \geq 1$, convergence of our operators to the unit operator with rates via Jackson type inequalities engaging the first Lp modulus of smoothness. Of interest here is a parametrized residual appearing term. Note that our operators are not positive.

Abstract: This study introduces a set of theorems that explore fixed point properties in metric spaces using novel mapping functions. Our primary objective is to extend the Banach contraction principle to metric spaces, representing a significant advancement in this field. Through these theorems and comprehensive investigations, we provide valuable insights into the unique characteristics of mappings within metric spaces. These results are particularly applicable in solving nonlinear integral equations, offering a robust theoretical foundation for addressing

equations with nonlinear operators. Additionally, our findings have practical relevance to transportation networks, where complex networks and optimization problems are common. We demonstrate the adaptability and versatility of our theorems through practical examples and applications.

Abstract: Aizpuru and Nicasio-Llach [1] introduced the spaces of vector valued sequences defined by statistical convergence and beside of some new characterizations like completeness, reflexivity and Shur properties of normed spaces, they also obtained a new version of Antosik-Swartz basic matrix theorem. Aizpuru et al. [2] and Kama [13] studied these properties in terms of vector valued almost convergence and f-statistical convergence, respectively. Recently, the authors gave some similar results on normed spaces by using a generalization of vector valued almost convergence, [17]. In the present paper, we essentially deal with invariant means (σ-summability) to have some new vector valued closed subspaces of l_∞(X) and bs(X), and to get some new characterizations of completeness, reflexivity, Schur and Grothendieck properties of normed spaces. We also give a new characterization of finite dimensionality of normed spaces.

Abstract: A map $F : N \to N$ is termed as a multiplicative right (respectively left) generalized derivation if there exists a multiplicative derivation d such that $F(xy) = F(x)y + xd(y)$ (respectively $F(xy) = d(x)y + xF(y)$) for all $x, y \in N$. The aim of the present article is to characterize these maps and also obtain the structure of a prime near ring if any one of the following assertions holds:
$(i)\ F([x,y]_g) = \pm x^m(x \circ y)_g x^n, (ii)\ F([x,y]_g) = \pm x^m[x,y]_g x^n, (iii)\ F(x \circ y)_g = \pm x^m(x \circ y)_g x^n, (iv)\ F(x \circ y)_g = \pm x^m[x,y]_g x^n, (v)\ F([x,y]_g) \pm [F(x),y]_g, (vi)\ F(x \circ y)_g = \pm(F(x) \circ y)_g, (vii)\ [x,F(y)]_g = \pm x^m[x,y]_g x^n, (viii)\ F([x,y]_g) = \pm[x,F(y)]_g, (ix)\ F(x \circ y)_g = \pm(x \circ F(y))_g, (x)\ [F(x),y]_g = \pm y^m[x,y]_g y^n$ for all $x, y \in U$, a nonzero semigroup ideal of N. Moreover, we provide examples to justify the necessity of primeness condition in the hypothesis of various results and also we have discussed the relationship between the zero-divisor graph and the prime graph of a near ring N.

Abstract: In this article, the concepts of soft El-algebra and ES structure of soft sets extend to proximity spaces and filters, and new notions of soft El-proximity and soft ES-proximity are defined with some characterizations. Firstly, we prove that the family of soft El-algebras, together

with homomorphisms, form a topological category over the family of soft sets defined by an El-algebra. Further, a proximity relation between soft El-algebra and soft sets over given El-algebra called soft El-proximity is induced by utilizing a soft El-neighborhood operator, and provides a new term soft El-supertopology. Proximity on ES structure called soft ES-proximity is also induced, and soft filter on ES structure generated by soft ES-proximity is presented with some important theorems and results. It is observed from this study that both proximities, i.e., soft El-proximity and soft ES-proximity, are basic proximities under different types of operations. The drawback of this work is that the proximity relations under soft M-subset and soft F-subset do not work for either the ES structure or the soft El-algebras. Integrating the proximity spaces with soft El-algebra and ES structure, this research article contributes to a better understanding and application of these mathematical tools to create new opportunities for handling uncertainty and parameterization.

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