Summaries of articles published in this issue

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(Publication of these summaries is permitted)

JIN BAI KIM, Morgantown: *Mutants in the symmetric semigroups.* Czech. Math. J. *21 (96),* (1971), 355—363. (Original paper.)

Let S_n be the symmetric (or full transformation) semigroup on n letters. A subset K of S_n is called a mutant if KK is contained in the complement of K in S_n. Author gives an explicit form of a maximal mutant of $T_{n-1} = S_n \setminus D_n$, where D_n denotes the D-class of rank n.

HOWARD B. LAMBERT, Commerce: *On unisolvent systems.* Czech. Math. J. *21 (96),* (1971), 364—365. (Original paper.)

The purpose of this paper is to give some miscellaneous results concerning unisolvent systems of equations.

VÁCLAV CHVÁTAL, Waterloo: *Some relations among invariants of graphs.* Czech. Math. J. *21 (96),* (1971), 366—368. (Original paper.)

R. E. Nettleton investigated relations among number vertices, connectivity, diameter, degrees of vertices and chromatic number of graphs. Author uses or improves his results to present a complete survey of the best possible bounds for the last two invariants in terms of the first three.

DONALD R. LATORRE, Clemson: *On semigroups that are semilattices of groups.* Czech. Math. J. *21 (96),* (1971), 369—370. (Original paper.)

Some idealtheoretic characterizations of semigroups mentioned in the title are given.

DAVID PREISS, Praha: *Limits of approximately continuous functions.* Czech. Math. J. *21 (96),* (1971), 371—372. (Original paper.)

In the paper it is proved that a function (possible infinite) defined on the real line is of the second class of Baire if and only if it is the limit of a sequence of approximately continuous functions. Consequently any function of the second class of Baire is the limit of a sequence of bounded derivatives.

DAVID PREISS, Praha: *Approximate derivatives and Baire classes.* Czech. Math. J. *21 (96),* (1971), 373—382. (Original paper.)

The main theorem of the paper says that the approximative derivative of an arbitrary function (which is defined on the real line) is of the first class of Baire with respect to the set of its existence. The following theorems give some conditions of monotonicity of functions and study the Denjoy and Darboux properties of approximative derivatives (some of these theorems were recently proved by L. Mišík provided that the approximative derivative of mentioned functions is of the first class). On the base of these theorems it is also proved that a set is a stationary set for approximative derivatives if and only if its complement is of the inner measure zero.

Anna Sekaninová, Milan Sekanina, Brno: *On the number of poly-nomials in ordered algebra.* Czech. Math. J. *21 (96)*, (1971), 391—398. (Original paper.)

In the paper there are studied algebras in the sense of prof. Marczewski, support of which is ordered and all fundamental operations of this algebra are isotone in all variables. It is proved that the set of all natural integers n for which there exists an essentially n-ary polynomial in the algebra can be quite arbitrary even when directed order is concerned.

Milan Sekanina, Brno: *Polynomials in topological algebras.* Czech. Math. J. *21 (96)*, (1961), 431—436. (Original paper.)

In the paper there are studied algebras in the sense of prof. Marczewski, support of which is a topological space and all fundamental operations of this algebra are continuous. There are studied sequences of the numbers of essentially n-ary polynomials in such algebras. There are some topo-logical properties which imply quite special form of this sequence. On the other hand there exist algebras on closed interval giving almost all such sequences occuring in abstract algebras.

Jiří Vanžura, Praha: *Tensor-invariants of submanifolds.* Czech. Math. J. *21 (96)*, (1971), 437—448. (Original paper.)

The present paper is a continuation of author's previous paper (Czech. Math. J. *19 (94)*, (1969), pp. 452—468). In the first paragraph sheaves of tensor invariants are introduced and their structure is studied. In the second paragraph we define a process of prolongation for tensor invariants and show that knowing all tensor invariants of order 1 of differentiability we get by prolongation all tensor invariants of order $l + 1$ of differentiability.

Robert E. Hall, Brockport: *Commutative cancellative semigroups with two generators.* Czech. Math. J. *21 (96)*, (1971), 449—452. (Original paper.)

A semigroup S is power joined if for each pair a, $b \in S$ there exist positive integers m and n such that $a^m = b^n$. Petrich determined all power joined, commutative, cancellative semigroups, without an identity, that can be generated by two elements. In this paper author finds the remaining commu-tative cancellative semigroups that can be generated by two elements.

Larry Mansfield, Flushing: *The method of moving frames applied to a space of bilinear forms.* Czech. Math. J. *21 (96)*, (1971), 453—460. (Original paper.)

The space of real symmetric binary bilinear forms is identified with R^3 up to a group action. This allows the vector space structure of R^3 to be used to define moving frames compatible with the action induced by a change of basis. Then invariants of families of bilinear forms are found using the information contained in the structure equations of the frame bundle. The construction of the frame bundle parallels the construction in Euclidean space but it is not based on the group of rigid motions.

Peter Fletcher, Blacksburg, S. A. Naimpally, Kanpur: *On almost complete and almost precompact quasi-uniform spaces*. Czech. Math. J. *21 (96)*, (1971), 383—390. (Original paper.)

In this paper Authors introduce almost complete and almost precompact quasi-uniform spaces. They show that almost precompact quasi-uniform spaces and almost complete quasi-uniform spaces relate to almost realcompact, countably almost-compact, and almost-compact topological spaces in a natural way. They also show that in a regular quasi-uniform space almost completeness and almost precompactness are equivalent to completeness and precompactness, respectively. They prove that almost completeness and almost precompactness are preserved under arbitrary products and obtain a generalization of Niemytzki-Tychonoff theorem.

Ján Jakubík, Košice: *Weak product decompositions of disrecte lattices*. Czech. Math. J. *21 (96)*, (1971), 399—412. (Original paper.)

The aim of this paper is to prove that any discrete lattice is a weak product of directly indecomposable factors. This result is then applied to a study of isomorphisms of unoriented graphs of modular lattices.

Ladislav Bican, Praha: *A note on mixed abelian groups*. Czech. Math. J. *21 (96)*, (1971), 413—417. (Original paper.)

Let G be a mixed abelian group with maximal torsion subgroup T. Let T_p denote the p-primary component of T. The groups G satisfying the condition $T_p = 0$ whenever G/T is not p-divisible are considered. The necessary and sufficient conditions for splittingness of such a group are given.

Jaroslav Smítal, Bratislava: *On approximation of Baire functions by Darboux functions*. Czech. Math. J. *21 (96)*, (1971), 418—423. (Original paper.)

In the paper it is shown that for each ordinal $\alpha \geqq 1$ there is a lattice Ω_α of real Darboux functions in Baire classes preceding α, defined on a real interval I such that the pointwise closure of Ω_α is the Baire class α. There are also given some results concerning monotone sequences of Darboux Baire functions.

Gary Chartrand and Don R. Lick, Kalamazoo: *Randomly eulerian digraphs*. Czech. Math. J. *21 (96)*, (1971), 424—430. (Original paper.)

A graph G is eulerian if it has a circuit containing all vertices and edges of G. In the paper an analogous concept for directed graphs (digraphs) is studied; namely a digraph D is eulerian if it has a (directed) circuits containing all vertices and arcs of D. Eulerian digraphs are characterized by the properties of being connected and having each of its vertices with equal indegree and outdegree.

Štefan Schwarz, Bratislava: *On the structure of dual semigroups*. Czech. Math. J. *21 (96)*, (1971), 461—483. (Original paper.)

The structural properties of a class of semigroups with zero (called dual semigroups) are studied.