Additions to Part I: Numerical List of Forms

Eliminate [8 F] and 360 from the list of unused forms in Parts I and II and add the following list of new forms.

[**0 AN**] No maximal open free filter in a T_2 topological space has a countable filter base. Herrlich/Tachtsis [1999c] and note 10.

[**0 AO**] Countably compact pseudometric spaces are Baire. Herrlich/Keremedis [1999a], notes 10 and 28.

[**0 AP**] Using the discrete topology on 2, 2^m is compact for every well ordered cardinal number m. Keremedis [1999b].

[**1 CI**] Every compact space is A-U compact. Herrlich [1996a], Howard [1990], and note 6.

[**1 CJ**] Every B compact Hausdorff space is A-U compact. Herrlich [1996a] and note 6.

[**1 CK**] Products of A-U compact (Hausdorff) spaces are A-U compact. Herrlich [1996a] and note 6.

[**1 CL**] Finite products of A-U compact spaces are A-U compact. Herrlich [1996a] and note 6.

[**1 CM**] Spaces with finite topologies are A-U compact. Herrlich [1996a] and note 6.

[**1 CN**] Products of spaces with finite topologies are compact. Alas [1969].

[**1 CO(X,Y)**] The product of X spaces is Y, where X is either "compact", "S-B compact", or "linearly compact" and Y is either "compact" or "S-B compact". Howard [1990] and note 6.

[**1 CP**] Form 384 + Form 8. Herrlich/Steprans [1997].

[**1 CQ**] Closed Filter Extendability for T_0 Spaces. Every closed filter in a T_0 topological space can be extended to a maximal closed filter. Keremedis/Tachtsis [1999c] and note 10.

[**1 CR**] The Ascoli Theorem for A-U compactness. See form [14 CU], note 6 and Herrlich [1997c]

[**1 CS**] Every W compact pseudometric space is A-U compact. See Howard [1990] (the proof of Theorem 3) and note 6.

[**1 CT**] Every sequentially compact pseudometric space is A-U compact. Herrlich [1997a]

[**1 CU**] Products of topological spaces with finite topologies are A-U compact. Herrlich [1997a] and note 6.

[**1 CV**] Products of finite discrete topological spaces are A-U compact. Herrlich [1996a] and note 6.

[**1 CW**] Every closed (open) filter in a T_1 topological space extends to a maximal closed (open) filter with a well orderable filter base. Keremedis/Tachtsis [1999a].

[**1 CX**] For every set $A \neq \emptyset$, every filter $\mathcal{F} \subseteq \mathcal{P}(A)$ extends to an ultra filter with a well orderable filter base. Keremedis/Tachtsis [1999a].

[**1 CY**] Every partial function on a set A can be defined as follow: Let ϱ, σ, φ, τ_1, τ_2, τ_3 be equivalence relations on A such that σ has a distinguished equivalence class D which is a set of distinct representatives for the equivalence classes of ϱ, φ has at most three equivalence classes D_1, D_2, and D_3, and the equivalence classes of τ_n, $n = 1, 2, 3$, have at most two elements. If $x \in A$ has a ϱ-representative $u \in D$ and there is an $n = 1, 2, 3$ such that $u \in D_n$, then choose the smallest n with this property and define $f(x) = u$, where $\{u, f(x)\} \in D_n$. Armbrust [1986].

[**8 F**] Every pseudometric space with a countable base is separable. Bentley/Herrlich [1998] and note 10.

[**8 V**] Every pseudometric Lindelöf space is separable. Bentley/Herrlich [1998] and note 10.

[**8 W**] Subspaces of pseudometric spaces are separable. Bentley/Herrlich [1998] and note 10.

[**8 X**] Every sequentially bounded pseudometric space is totally bounded. Bentley/ Herrlich [1998] and note 10.

[**8 Y**] Every totally bounded pseudometric space is separable. Bentley/Herrlich [1998] and note 10.

[**8 Z**] Every sequentially bounded pseudometric space is separable. Bentley/Herrlich [1998] and note 10.

[**8 AA**] Baire Category Theorem for Complete Pseudometric Spaces with a countable base. Every non-empty complete pseudometric space with a countable base is of the second category (non-meager). Bentley/Herrlich [1998] and note 28.

[**8 AB**] Baire Category Theorem for Complete Totally Bounded Pseudometric Spaces. Every non-empty complete totally bounded pseudometric space is of the second category (non-meager). Bentley/Herrlich [1998], and notes 6 and 28.

[**8 AC**] Every sequentially compact pseudometric space is totally bounded. Bentley/ Herrlich [1998] and notes 6 and 10.

[**8 AD**] Every totally bounded, complete pseudometric space is compact. Bentley/ Herrlich [1998] and notes 6 and 28.

[**8 AE**] Every sequentially compact pseudometric space is compact. Bentley/Herrlich [1998] and note 10.

[**8 AF**] In a pseudometric space, every infinite subset has an accumulation point if and only if the space is complete and totally bounded. Bentley/Herrlich [1998] and note 10.

[**8 AG**] Compact pseudometric spaces are separable. Bentley/Herrlich [1998] and note 10.

[**8 AH**] In a metric space X, if x is an accumulation point of a subset $A \subseteq X$ then there is a sequence of elements of A which converges to x. Herrlich/Steprans [1997].

[**8 AI**] A function from one metric space to another is continuous if and only it is sequentially continuous. Herrlich/Steprans [1997].

[**8 AJ**] Countable products of pseudometric spaces are Baire. Herrlich/Keremedis [1999a], notes 10 and 28.

[**8 AK**] Countable products of pseudometric spaces are compact. Herrlich/Keremedis [1999a] and note 10.

[**8 AL**] For pseudometric spaces, every Cauchy filter converges if and only if every Cauchy sequence converges. Herrlich/Keremedis [1999a] and note 10.

[**8 AM**] Every sequentially compact pseudometric space is Baire. Herrlich/Keremedis [1999a], notes 6, 10 and 28.

[**8 AN**] Every sequentially compact, totally bounded pseudometric space is Baire. Herrlich/Keremedis [1999a], notes 6, 10 and 28.

[**9 U**] There exists an A-U compact Hausdorff topology on every set. Herrlich [1996a] and note 6.

[**9 V**] There exist an A-U compact T_1 topology on every set. Herrlich [1996a] and note 6.

[**9 W**] The Alexandroff compactification of a discrete space is A-U compact. Herrlich [1996a] and note 6.

[**9 X**] In every sequentially compact pseudometric space, every infinite set has an accumulation point. Bentley/Herrlich [1998] and note 10.

[**9 Y**] Every infinite tree has a countably infinite chain or a countably infinite antichain. Keremedis [1999a] and note 21.

[**10 P**] Countable products of finite Hausdorff spaces are Baire. Herrlich/Keremedis [1999b] and note 28.

[**10 Q**] Countable products of non-empty finite sets are non-empty. Herrlich/Keremedis [1999b].

[**10 R**] For every sequence $(X_n)_{n\in\omega}$ of non-empty finite sets, $\mathcal{P}(\bigcup_{n\in\omega} X_n)$ is linearly orderable. Herrlich/Keremedis [1999b].

[**14 CN**] A system of polynomial equations over the field $\{0, 1\}$ has a solution if and only if every finite subsystem has a solution. Note 30.

[**14 CO**] Every B compact space is compact. Herrlich [1996a] and note 6.

[**14 CP**] Every closed filter in a topological space is contained in a prime closed filter. Herrlich/Steprans [1997] and note 10.

[**14 CQ**] Every z-filter in a topological space is contained in a prime z-filter. Herrlich/Steprans [1997] and note 10.

[**14 CR**] Every z-filter in a topological space is contained in a maximal z-filter. Herrlich/Steprans [1997] and note 10.

[14 CS] Every clopen filter in a topological space is contained in a prime (=maximal) clopen filter. Herrlich/Steprans [1997] and note 10.

[14 CT] Every open filter in a topological space is contained in a prime open filter. Herrlich/Steprans [1997] and note 10.

[14 CU] The Ascoli Theorem. If X is a locally compact Hausdorff space, Y is a metric space, $C_\infty(X, Y)$ is the space of all continuous functions from X to Y with the compact-open topology, and F is a subspace of $C_\infty(X, Y)$ then the following conditions are equivalent:

(1) F is compact

(2) (a) For each $x \in X$, the set $F(x) = \{f(x) : f \in F\}$ is compact in Y.

(b) F is closed in the product space Y^X,

(c) F is equicontinuous.

Herrlich [1997b] and note 10.

[14 CV] The Ascoli Theorem for B compactness. See form [14 CU], note 6, and Herrlich [1997b].

[14 CW]The projective limit of a directed projective system of non-empty, compact, T_2 topological spaces is a non-empty, compact, T_2 topological space. Rav [1976] and note 71. (Compare with [14 CD] through [14 CG].)

[14 CX] The projective limit of a directed projective system of finite topological spaces with the discrete topology is a non-empty, compact, T_2 topological space. Rav [1976] and note 71. (Compare with [14 CD] through [14 CG].)

[14 CY] Let

(*) $$G_i(x_{i_1}, x_{i_2}, \dots, x_{i_k}), i \in I$$

be a system of equations in the variables $\{x_j : j \in V\}$ with the following properties:

(1) For each $j \in V$, the variable x_j, has a finite domain, D_j.

(2) Given any finite number of variables, there is an equation in the system (*) which contains those variable and possibly others.

(3) For each equation in the system (*) there is an equation in (*) with the same, or possibly more, variables which has a solution.

Then, the system (*) has a partial solution. (The family of equations $(x_j = d_j)_{j \in V}$ with $d_j \in D_j$ is called a *partial solution* of the system (*) if for every finite subfamily of equations

(**) $$x_i = d_i, \dots, x_k = d_k,$$

there is an equation in the system (*) with the variables $x_i, \dots, x_k$, and possibly other variables, such that (**) is part of the complete solution of that equation.) Abian [1973] and note 149.

[**14 CZ**] Wallman's Lemma. Assume $\mathcal{C} = \{C_j : j \in J\}$ is a family of finite sets. For each $j \in J$, let $b_j = \bigcup C_j$ and assume that the family $\{b_j : j \in J\}$ has the finite intersection property. Then there is a choice function f for $\mathcal{C}$ such that $\{f(C_j) : j \in J\}$ has the finite intersection property. Cowen [1983].

[**43 AD**] Every Frechet complete (pseudo)metric space is Baire. Herrlich/Keremedis [1999a], notes 10 and 28.

[**43 AE**] Countable products of compact Hausdorf spaces are Baire. Herrlich/Keremedis [1999a] and note 28.

[**43 AF**] Every infinite branching poset (a partially ordered set in which each element has at least two lower bounds) has either a countably infinite chain or a countably infinite antichain. Keremedis [1999a].

[**67 W**] Every closed (open) filter in a T_1 topological space has a well orderable filter base. Keremedis/Tachtsis [1999c] and note 10.

[**67 X**] Every open ultrafilter in T_1 topological space has a well orderable filter base. Keremedis/Tachtsis [1999c] and note 10.

[**67 Y**] For every set $A \neq \emptyset$, every filter contained in $\mathcal{P}(A)$ has a well orderable filter base. Herrlich/Tachtsis [1999a] and note 10.

[**67 Z**] Every closed (open) filter in a dense in itself T_1 topological space has a well orderable filter base. Keremedis/Tachtsis [1999a] and note 10.

[**67 AA**] If (X, T) is a T_2 topological space and $\mathcal{B}$ is a lattice of closed sets, then every maximal $\mathcal{B}$ filter has a well orderable filter base. Keremedis/Tachtsis [1999a] and note 10.

[**82 C**] P-$\aleph_0$: For every infinite set X, there is a partition of X of cardinality $\aleph_0$. González [1995a].

[**126 L**] No maximal closed free filter in a T_1 topological space has a countable filter base. Keremedis/Tachtsis [1999c] and note 10.

[**126 M**] Weierstrass compact pseudometric spaces are countably compact. Keremedis [1999c] and notes 6 and 10.

[**126 N**] Weierstrass compact pseudometric spaces are compact. Keremedis [1999c] and notes 6 and 10.

[**126 O**] Every compact pseudometric space has a dense subset which can be written as a countable union of finite sets. Keremeids [1999c] and note 10.

[**126 P**] Every compact pseudometric space has a dense subset which can be written as a well ordered union of finite sets. Keremeids [1999c] and note 10.

FORM 360. A system of linear equations over the field $\{0, 1\}$ has a solution, if and only if every finite subsystem has a solution. Brunner [1999].

[**374 B**$(n+1)$] Countable products of Hausdorff spaces X_m, with $|X_m| \leq n+1$, $m \in \omega$, are compact. Herrlich/Keremedis [1999b].

[**374 C($n+1$)**] Countable products of Hausdorff spaces X_m, with $|X_m| \leq n+1$, $m \in \omega$, are Baire. Herrlich/Keremedis [1999b] and note 28.

FORM 384. Closed Filter Extendability for T_1 Spaces. Every closed filter in a T_1 topological space can be extended to a maximal closed filter. Herrlich/Steprans [1997] and note 10.

FORM 385. Countable Ultrafilter Theorem: Every proper filter with a countable base over a set S (in $\mathcal{P}(S)$) can be extended to an ultrafilter. Herrlich/Keremedis [1999a].

FORM 386. Every B compact (pseudo)metric space is Baire. Herrlich/Keremedis [1999a], notes 6, 10, and 28.

FORM 387. DPO: Every infinite set has a non-trivial, dense partial order. (A partial ordering $<$ on a set X is dense if $(\forall x, y \in X)(x < y \rightarrow (\exists z \in X)(x < z < y))$ and is non-trivial if $(\exists x, y \in X)(x < y)$). González [1995a].

FORM 388. Every infinite branching poset (a partially ordered set in which each element has at least two lower bounds) has either an infinite chain or an infinite antichain. Keremedis [1999a].

FORM 389. $C(\aleph_0, 2, \mathcal{P}(\mathbb{R}))$: Every denumerable family of two element subsets of $\mathcal{P}(\mathbb{R})$ has a choice function. Keremedis [1999b].

FORM 390. Every infinite set can be partitioned either into two infinite sets or infinitely many sets, each of which has at least two elements. Ash [1983] and Howard/Yorke [1989].

FORM 391. $C(\infty, LO)$: Every set of non-empty linearly orderable sets has a choice function.

FORM 392. $C(LO, LO)$: Every linearly ordered set of linearly orderable sets has a choice function.

FORM 393. $C(LO, WO)$: Every linearly ordered set of non-empty well orderable sets has a choice function.

FORM 394. $C(WO, LO)$: Every well ordered set of non-empty linearly orderable sets has a choice function.

FORM 395. $MC(LO, LO)$: For each linearly ordered family of non-empty linearly orderable sets X, there is a function f such that for all $x \in X$ $f(x)$ is non-empty, finite subset of x.

FORM 396. $MC(LO, WO)$: For each linearly ordered family of non-empty well orderable sets X, there is a function f such that for all $x \in X$ $f(x)$ is non-empty, finite subset of x.

FORM 397. $MC(WO, LO)$: For each well ordered family of non-empty linearly orderable sets X, there is a function f such that for all $x \in X$ $f(x)$ is non-empty, finite subset of x.

FORM 398. $KW(LO, \infty)$, The Kinna-Wagner Selection Principle for a linearly ordered family of sets: For every linearly ordered set M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 399. $KW(\infty, LO)$, The Kinna-Wagner Selection Principle for a set of linearly orderable sets: For every set of linearly orderable sets M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 400. $KW(LO, LO)$, The Kinna-Wagner Selection Principle for a linearly ordered set of linearly orderable sets: For every linearly ordered set of linearly orderable sets M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 401. $KW(LO, < \aleph_0)$, The Kinna-Wagner Selection Principle for a linearly ordered set of finite sets: For every linearly ordered set of finite sets M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 402. $KW(WO, LO)$, The Kinna-Wagner Selection Principle for a well ordered set of linearly orderable sets: For every well ordered set of linearly orderable sets M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 403. $KW(LO, WO)$, The Kinna-Wagner Selection Principle for a linearly ordered set of well orderable sets: For every linearly ordered set of well orderable sets M there is a function f such that for all $A \in M$, if $|A| > 1$ then $\emptyset \neq f(A) \subsetneq A$.

FORM 404. Every infinite set can be partitioned into infinitely many sets, each of which has at least two elements. Ash [1983] and Howard/Yorke [1989].

FORM 405. Every infinite set can be partitioned into sets each of which is countable and has at least two elements.