The Largest Cardinals of Isomorphic Class of Topology-set-lattices on an Infinite Set *

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Let X be an infinite set, $K=\{\tau:\tau$ is a topology on $X\}$, define $\tau\cong\sigma$ iff $(\exists f)$ (f is a lattice-isomorphism from τ to σ), for a given $\tau\in K$ we define $\hat{\tau}=\{\sigma:\ \sigma\in K$ & $\sigma\cong\tau\}$, $K^*(\subset K)$ is an incomparable class iff $(\forall\tau\in K^*)(\forall\sigma\in K^*)(\tau\neq\sigma\to\tau$ and σ are incomparable), $M=\{K^*: K^*$ is an incomparable class$\}$.

Theorem 1 $\sup\{|\hat{\tau}|:\tau\in K\}=\max\{|\hat{\tau}|:\tau\in K\}=|K|=2^{2^{|X|}}=\exp(\exp(|X|))$.

Theorme 2 $\sup\ \{\sup\{|\hat{\tau}|:\tau\in K^*\}: K^*\subset K\ \&\ K^*$ is an incomparable class$\}=\sup\{|\hat{\tau}|:\tau\in K^*\&K^*\in M\}=\max\{|\hat{\tau}|:\tau\in K^*\&K^*\in M\}=2^{2^{|X|}}=\exp(\exp(|X|))=\sup\{|\hat{\tau}|:\tau\in K\}=\max\{|\hat{\tau}|:\tau\in K\}=|K|$.

In the proof of the above-mentioned theorems, the AC and GCH will be used.

References

[1] Yang An-zhou and Zheng Chong-you, Numbers of Topologies and Lattices of Sets on an Infinite Set, J. *M. R. E.*, Vol. 4, 1(1984), 146.

[2] Zheng Chong-you and Yang An-zhou, The Largest Cardinals of Homeomorphic Class and Isomorphic Class of Set-lattices on an Infinite Set, J.*M R.E.*, Vol. 4, 1 (1984), 94.

* Received Oct. 20, 1983.