STA 2001 - PROBLEM SESSION

Given $\{U_\lambda \mid \lambda \in \Lambda\}$ and $\{V_\mu \mid \mu \in \mathrm{M}\}$ two families of uniserial modules over any ring. Decide when $\oplus_\Lambda U_\lambda \simeq \oplus_\mathrm{M} V_\mu$. The problem has been solved for Λ and M finite and it can be reduced to the case $|\Lambda| = |\mathrm{M}| = \aleph_0$ and all U_λ and V_μ countably generated.
(A. Facchini)

If a domain is locally almost perfect then all torsion modules are semiartinian. Can this implication be reversed? (L. Salce)

Given a left Noetherian ring R and an irreducilble left ideal I, describe the injective hull of R/I. Find examples that are not describable. (T. Kucera)

Let us order cotorsion theories by the inclusion of the second (cotorsion) class. Is there for a given cotorsion theory $(\mathcal{A}, \mathcal{B})$ a maximal perfect cotorsion theory contained in it? If yes, what is the maximal perfect cotorsion theory contained in (Projective, All modules)?
(E. Enochs)

Let $\mathcal{A}$ be the class of absolutely pure modules. Prove that the cotorsion theory $({}^\perp\mathcal{A}, \mathcal{A})$ is equal to (All modules, Injective) iff $({}^\perp\mathcal{A}, \mathcal{A})$ is perfect iff $\mathcal{A}$ is enveloping iff the ring is left Noetherian. (E. Enochs)

Are non-zero direct summands of the group $\mathbb{Z}^{\aleph_1}/\mathbb{Z}^{<\aleph_1}$ all isomorphic to $\mathbb{Z}^{\aleph_1}/\mathbb{Z}^{<\aleph_1}$?
(R. Goebel)

Module over a ring R is p-injective if it is injective with respect to embeddings $Ra \subseteq R$ for all $a \in R$. M is generally p-injective (gp-injective) if for all $a \in R$ there is a positive integer n such that $a^n \neq 0$ and M is injective with respect to $Ra^n \subseteq R$. The ring is π-regular iff all modules are gp-injective. The ring R is said to be left p-injective (left gp-injective) if ${}_RR$ is p-injective (gp-injective). Find an example of a gp-injective ring which is not p-injective. (J. Clark)

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