Document Type	:	Thesis
Document Title	:	*Extended Method of Quasilinearization for the Forced Duffing Equation* *طريقة شبية الاخطاط الموسعة لمعادلة دفنج القسريه*
Document Language	:	Arabic
Abstract	:	An interesting and fruitful technique for proving existence results for nonlinear problems is the method of upper and lower solutions. This method coupled with the monotone iterative technique, known as quasilinearization technique, manifests itself as an effective and flexible mechanism that offers theoretical as well as constructive existence results in a closed set, generated by the lower and upper solutions. The lower and upper solutions serve as rough bounds, which can be improved by monotone iterative procedures. The ideas embedded in these techniques have proved to be of immense value and have played a crucial role in unifying a wide variety of nonlinear problems. However, the concavity/convexity assumption that is demanded by the method of quasilinearization, proved to be a stumbling block for further development of the theory. The nineties brought new dimensions to this technique and the method was generalized, refined and extended in several directions to make it applicable to a much larger class of nonlinear problems by relaxing the convexity assumption. In this thesis, we have presented some extended versions of quasilinearization for periodic boundary value problems involving a forced Duffing equation. In fact, we establish monotone sequences of upper and lower solutions converging quadratically to the unique solution of the problem at hand. As a second problem, we apply the generalized quasilinearization technique to a forced Duffing equation with nonlinear three-point boundary conditions and obtain a monotone iteration scheme whose iterates converge quadratically to the unique solution of the problem
Supervisor	:	د/ بشير بن أحمد فقير محمد
Publishing Year	:	2006