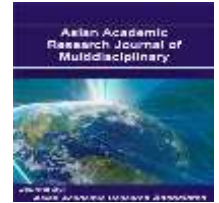




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## PARAMETERS USING ARITHMETIC APPROXIMATION THEORY AND METAHEURISTIC OPTIMIZATION

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### Abstract

This paper presents a new method for analyzing and calculating the oscillations of multi-storey frame with interval parameters. The solution of the oscillation differential equation with interval parameters is presented clearly. From there, the authors examine the influence of input parameters such as load amplitude, frequency of oscillation to the internal force of the structure. Apply the solution of the oscillation differential equation for oscillation analysis of the 3-span and 18-storeys flat frame structure subjected to periodic dynamic load with interval input parameters. The calculation results in the Maple computing environment show the relationship between the load amplitude, the oscillation frequency and the displacement and moment of the structure. The research findings are important and should be considered in the design as well as in the reliability assessment of the structures.

**Keywords:** Interval numbers, Interval analysis, Interval finite elements, Structure oscillation, Dynamic of structures, Interval dynamic response.

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