

عنوان مقاله:

Vibrational Characteristics of FG Porous Micro Plates Integrated with FG-CNTRC Skins Subjected to Lorentz Force

محل انتشار:

بیست و نهمین همایش سالانه بین المللی انجمن مهندسان مکانیک ایران و هشتمین همایش صنعت نیروگاه های حرارتی (سال: 1400)

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خلاصه مقاله:

A sinusoidal shear deformation theory is employed to analyze free vibration behavior of a three-layered functionally graded (FG) porous rectangular micro plate which is located between two polymeric nanocomposite layers. The Lorentz force is applied to the structure. Also, it is rested on an elastic foundation which is modeled by Pasternak type. The properties of the core and faces are changed through the thickness direction following the given functions. The small dimensions effect is considered using modified couple stress theory (MCST) which presents a length scale parameter. Hamilton's principle and Navier's method are employed to derive and solve the motion equations, respectively. Effect of the most prominent parameters such as porosity coefficient and distribution and also effect of magnetic load is considered and discussed in details. Findings of the present study can be accounted as a benchmark for future studies and also may be used to design more efficient structures which are subjected to physical loads.

کلمات کلیدی:

Vibration analysis, Sinusoidal shear deformation theory, Modified couple stress theory, porous material, Carbon nanotubes reinforced composites.

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