In recent years, the parametric vibrations of FG shells have received more attention because of their importance in the modern aerospace industry, missile technology and mechanical engineering. The parametric vibration of shear deformable functionally graded (FG) truncated conical shells subjected to static and time dependent periodic uniform lateral pressures is studied. This study is one of the first attempts on the parametric vibration of freely supported FG truncated conical shells based on the first order shear deformation theory (FSDT). The material properties of FG truncated conical shells vary continuously through the thickness according to a power-law distribution in terms of the volume fractions of the constituents. Initially, the governing relations and equations are derived within first order FSDT using the Donnell shell theory. To solve the governing equations is used an unknown parameter, A, that will be determined from the minimum conditions of critical parameters for freely supported boundary conditions. Employing Galerkin's method, these partial differential equations are reduced into a Mathieu type differential equation describing the parametric vibration behavior of the FG truncated conical shells. Following Bolotin's method, the dimensionless excitation frequencies are determined. Numerical results are also presented to bring out the effects of shear stresses, volume fraction index, FG profiles, static and dynamic load factors and truncated conical shell characteristics on the instability regions. The expressions and results that obtained in current study can be used in the development stage, testing and exploitation of FG conical shells in the constructions.