This research presents an experimental and theoretical investigation of the effect of cutouts on the stress and strain of composite laminate plates subjected to static loads. The experimental program covers measurement of the normal strain at the edges of circular and square holes with different number of layers and types of composite materials by using strain gages technique under constant tensile loads. A numerical investigation has been achieved by using the software package (ANSYS), involving static analysis of symmetric square plates with different types of cutouts. The numerical results include the parametric effects of lamination angle, hole dimensions, types of hole and the number of layers of a symmetric square plate. The experimental results show good agreement compared with numerical results. It is found that increasing the number of layers reduces the value of normal strain at the edges of circular and square holes of a symmetric plate and the maximum value of stress occurs at a lamination angle of (30o ) and the maximum value of strain occurs at a lamination angle of (50o ) for the symmetric square plates subjected to uni-axial applied load. The hole dimensions to width of plates ratio is found to increase the maximum value of stress and strain of a symmetric square plate subjected to uniaxial applied load. Moreover, the value of maximum stress increases with the order of type of circular, square, triangular and hexagonal cutout, whereas the value of maximum strain increases with the order of type of circular, square, hexagonal and triangular cutout.