Over the past two decades, Egypt was hit by few earthquakes that resulted in significant loss of life and property. Several Reinforced concrete (RC) buildings were damaged or collapsed prior to October 1992 Cairo earthquake. There was no seismic design code in Egypt the most common type of existing buildings in Egypt is the RC buildings. Most of these buildings were built in the last 50 years. And designed to resist gravity loads only. An effective risk assessment measure is to identify the most vulnerable buildings that may undergo severe damage in a future earthquake for this reason. Old existing RC buildings are believed to be vulnerable to damage from lateral loads caused by severe effective methodology for risk mitigation must be focused on identifying earthquakes. Therefore, the hazardous buildings in urban environments A sample building set is selected to reflect existing construction practice including regular buildings and those with vertical irregularities; these building represent medium-rise gravity Load Designed (GLD) RC buildings. Seismic damage assessment is performed for those buildings through fragility analysis. Fragility curves of the investigated building set are determined by nonlinear time history analysis to evaluate the damage state. These curves are used to represent the probabilities that the structural damages. Under various levels of seismic excitation, exceed specified damage states by means of earthquake intensity damage relations. Fragility curves are represented by lognormal distribution functions with two parameters and developed as a function of Peak Ground Acceleration (PGA). Different characteristics of ground motion excitation are employed in the analysis. Ground motion with different frequency contents is utilized: Low, Medium and High frequency content earthquakes. The present research work assesses the effect of the ground motion characteristics on fragility analysis. Also, it evaluates seismic vulnerability of the most commonly used type of multi-story RC buildings. Special attention is placed upon examining RU buildings with vertical irregularity, A two dimensional finite element computer program IDARC V.6.1 (2006) (Inelastic damage Analysis of Reinforced Concrete structures) for seismic inelastic structural analysis is employed. This program takes into account cracking, Reinforcement of RC member and both geometric and material nonlinearity. The study represents an attempt to evaluate the seismic vulnerability of the building stock in Egypt. The analytical damage evaluation in this study shows that the seismic effects of earthquakes experienced in Egypt may be significant. Moreover, It shows that some of earthquakes may impose excessive displacement demands on the investigated buildings. In addition. The results show that the effect of input ground motion characteristics may have significant effects on fragility curves. Therefore, diligent consideration is required when ground motions are selected for the derivation of fragility curves. Finally, the study shows that irregular RC buildings are more vulnerable than the regular ones...