In this study, it was investigated the amplification effect and dominant frequencies of the earthquake waves, in the 5-floors building and the ground where was built it. With this purpose, accelerometers were placed on the roof and ground of the 5-floors building in 2008. In order to determine the ground class, the MASW measure was taken, shear wave velocity (Vs30) was calculated for the first 30 m. Accelerometers that were placed in the building and the ground recorded earthquakes with moment magnitude of 3, 4, 5 and 6 at close and far distances from different sources. Spectral ratio technique and horizontal / vertical spectral ratio technique have been applied to earthquake signals depending on the reference method and single station method in order to obtain the amplification of the building and the ground. As a result of the application of these techniques, the resonance conditions, the dominant frequencies, and the amplifications which belong to building and ground were investigated. As a result, amplitude amplification of the earthquake waves passing from the ground to the building depending on the earthquake magnitude and distance was obtained between 6 and 12.