5) For each of the following methods, answer the questions: a) what does this method do? b) when is this method used, plus any other special requests as listed.

* **Guyan Reduction**: It removes the undesirable DOF’s form the model. Typically, if mass matrix is singular, DOF’s with low Mii/Kii are subject for removal from the model. It is also used when BC’s are applied using Lagrange multipliers. Also, when applying shear locking relaxation, this method can be used to reduce out the node-less DOF’s
* **SEREP**: It is used to reduce the size of the system to a smaller number so that the model only includes p modes or m DOFs that are necessary to the model analysis. This also serves to speed up the solution time. It can be used to reduce out the BC DOFs.
* **Newmark**: It is a numerical integration scheme for dynamic systems that marches through time. It is used to solve linear dynamic problems subject to dynamic loading. Displacement, vel, and accel vectors of the system can be obtained at each delta-t increment until the desired time limit.
* **Power Method**: Can be used to get the first eigenvalue and eigenvector of the system. This method is used in conjunction with the matrix deflation in order to obtain the second eigenvector.
* **Subspace Iteration**: It is used to obtain a predefined number of eigenvalues and eigenvectors from a larger system where we are only interested in a subset of eigenvalues and eigenvectors. When K is singular it will need to be shifted before subspace iteration is applied.