

Question 2 (a) continued...

considered. 3D elements are more complex and time consuming because this information is defined by the geometry. The final stage of the pre-processing is loading.

Loading - Once the above information has been added, the final requirements for processing is the loading and boundary conditions. Here it is important that the part is fully constrained so that accurate predictions/calculations can be made relating to the loading the part will be subjected to. Without fully constraining the part, the degrees of freedom for each node will not be accurate.

Question 2

- (b) Processing describes the computer software actually carrying out the calculations of matrix algebra. FEA is all about calculating a stiffness matrix for the structure being considered. Sets of simultaneous equations can only be obtained and solved once all of the information is obtained during the pre-processing stage. Hence it is clear that the information needs to be accurate at this stage to obtain reliable results. These calculations would have previously been done manually although as computing power improves, we are able to exploit this to process more complex problem. ~~At~~ Although, it should always be remembered that there is a trade off between run time and accuracy of results. Also, the method is an approximation.