

1. Verify Conservation of Energy in a simple beam structure at equilibrium and derive the Principle of Virtual Work.
2. Derive Equilibrium Equation from Conservation of Energy.
3. Derive Divergence Theorem in 3D plane.
4. Write the definition of the Potential Problem.
5. Write the definition of the Path Independency and express it with mathematical formula.
6. Traction T and body force b are applied to the 3D structure at equilibrium. Derive integral form of equilibrium and from it derive equilibrium equation in differential form.
7. Derive that the Governing equation of the system is expressed as Laplace Equation where the system holds Conservation of Energy and is defined in Potential problem.
8. Calculate the reactions of the beam shown below, by the principle of virtual work.

