1) **Using integral methods**, find the shear force and bending moment for the simply supported beam loaded as shown. Sketch these on the axes provided.

![ Beam Diagram ](image1)

2) The solid bar with circular cross section is loaded as shown. Determine the stresses at A. Sketch the state of stress on the element provided at the bottom of the page.

![ Bar Diagram ](image2)

3) The cross section of a beam is shown in the figure. Determine the shear stress at the joint due to a transverse shear load of “V.”

![ Beam Cross Section ](image3)

4) A thin walled pressure vessel of radius “R” and wall thickness “t” is subjected to a torsional load “T,” bending moment “M,” and internal pressure “p.” Determine the state of stress at A and sketch the state of stress on the element provided. (Recall l=\(\pi r^3 t / 2\), \(J=\pi r^4 t\), \(A=2\pi rt\) for thin walled tube)

![ Vessel Diagram ](image4)