



T-03 Forces in a 7-bar Truss

(1 **TS-03** Truss member Set3; 1 **SL-03** String Lines with end hook connection)

Aims: This experiment is designed to allow students to observe measure and compare the static displacements and associated force equilibrium conditions at the common connection node of a 7-bar truss (all members nominally of equal initial length and stiffness) to separate and simultaneous loading applied at two selected nodes (to be advised by the instructor from a Table).

Learning Outcomes:

After performing this experiment, students will be able to:

- (i) Use the Spreadsheet supplied to compare the predicted forces in each member of a 7-bar truss induced by the applied load cases considered using the method of joints with the experimentally obtained values of these forces.
- (ii) Reinforce their understanding of the application of the method of joints and the method of sections on the evaluation of forces induced in members and in reactions on a 7-bar truss.
- (iii) Reinforce their understanding of the principle of superposition in the context of application to a 7-bar pin-jointed truss.
- (iv) Appreciate the role played by a member's characteristic stiffness in the stiffness method in the evaluation of internal actions from the individual member elongation/contraction.

Equipment/Resources Required:

- (i) **TM-00** (Pixi with window frame in "landscape" configuration with transparent film & pens; Set of two adjustable assemblies of stainless steel weights; Digital Scales for weight force evaluation)
- (ii) A digital camera – Better than 8Mega Pixel preferred (Hi-Res phone cameras are suitable)
- (iii) **xyRectify** photogrammetric software on a suitable Notebook, Laptop or PC – if desired.