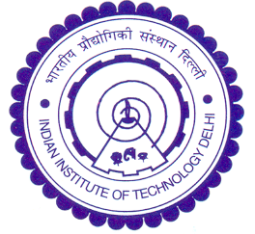


DEPARTMENT OF CIVIL ENGINEERING



MINOR II:CEL727 DESIGN OF INDUSTRIAL STRUCTURES (2011-12)

Time allowed: 30 minutes
Venue : IV 323

Date : 08 October 2011
Max marks : 10

NOTE: (a) This question paper contains one question and one page only. (b) All questions are compulsory. (c) Assume any data which you deem is necessary but not supplied. (d) Draw neat and clear sketches wherever required.

Question 1

Figure 1 shows a trussed shed structure under dead loads and wind loads. The resultant forces are shown as point loads acting on the structure at appropriate locations. The designer has adopted ISMB 400 (of grade Fe 410 W conforming to IS 2062) as column and M24 bolts (conforming to IS 1367) of grade 5.8 as the anchor bolts. In order to connect the column base, determine the following:

- Height of the gusset plates necessary such that the fillet welded connection is adequate. Assume that f_u of the weld metal to be higher than that of the parent metal. Assume a weld size of 8mm and welding is performed in the shop.
- Determine the number of anchor bolts in each of two parallel rows (separated by a distance of 650mm) necessary for securing the column base to concrete pedestal. Assume concrete of grade M40 and base plate of size 850x500mm in size. **You may ignore shear stresses in bolt for simplicity.**

(4+ 6 =10 marks)

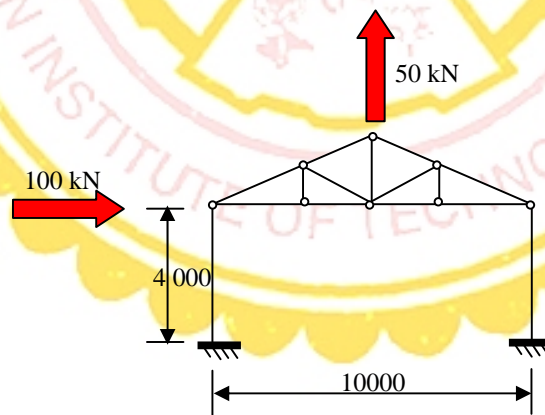


Fig. 1 Elevation of frame (All dimensions in mm)