SUBJECT: CEPC27 Advanced Steel Structural Elements

FINAL ASSESSMENT

SEMESTER: VII   **Date: 04.12.2020**
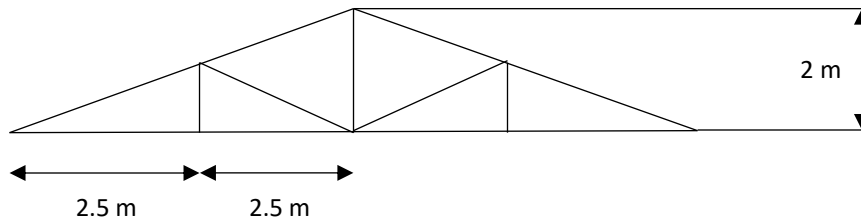**Marks: 30**   **Time: 02.30 pm – 05.00 pm**

Answer all the questions

1. An Industrial building has following data.
   a. Building is located in Trichy and it has large openings. Terrain and topography of the location are open with well scattered obstructions and flat respectively. Life span of building is 5 years.
   b. Span and height of the building are 10 m and 5m respectively. Columns are spaced at 3 m longitudinally.
   c. Loading Details:
      i. Dead load of GI sheets with fixings $= 200 \text{ N/m}^2$
      ii. Self-weight of Truss $= 60 \text{ N/m}^2$
      iii. Self-weight of Purlins $= 70 \text{ N/m}^2$
      iv. Live load $= 300 \text{ N/m}^2$
      v. Critical Load Combination $= 1.5 \text{ (DL + WL)}$
   d. Truss Details:
      i. Simply supported truss and refer the fig below.

A. Check the adequacy of sections **ISMB 100** for **purlins** and **Double angle ISA 50x50x6** for **bottom chord of truss** for the critical load combination mentioned in c.
(WL calculation **(5 Marks),** Analysis of Truss **(5 Marks),** Design of Top chord **(4 Marks),** Design of Purlin **(6 Marks)**)

2. Check the adequacy of ISHB350 (661.N/m) beam column for the following demands:
   a. Axial load of 1500 kN and a bending moment of 80 kNm about its major axis and 30 kNm about its minor axis at both top and bottom. The effective length of the column is 4 m. **(10 Marks)**