Roll No......................

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- April 2018

B-Tech VIIIth Semester

COURSE CODE: 10M1WCE212   MAX. MARKS: 25

COURSE NAME: Design of Steel Structures

COURSE CREDITS: 4   MAX. TIME: 1.5 Hrs

Note: (i) All questions are compulsory.
(ii) Carrying of mobile phone during examinations will be treated as case of unfair means.
*(iii) **IS-800:2000** and **IS-808:1989** are allowed.(Sharing of codes is strictly prohibited)*

Course Objectives

CO-1 *Apply the principles of plastic design in steel beams & portal frames*
CO-2 *Determine the loads acting on it and identify the typical failure modes..*
CO-3 *Design and prepare structural layout of water tanks, Stacks, IB*
CO-4 *Analysis and design of Cold Form Sections*

Q2. Design the specified members of a roof truss of an Industrial Building with 25 m span and 120 m length (see figure in the backside). The roofing is galvanised iron sheeting. The basic wind speed is 50 m/s and terrain is open industrial building. {For simplicity, use loads and member forces given for each part}   **CO-1, CO-2 and CO-3 [10+5+5+5]**

a) Design **purlin** for the sheets (try Channel Section)
Live Load = 0.35 KN/sq.m
Dead live = 0.21 KN/sq.m
Wind Pressure = 1.457 KN/sq.m

b) Design of top chord member (**G - H**) (try T-section)
Max. Compressive force = 184.05 KN
Max. Tensile Force = 347.4 KN

c) Design of bottom chord member (**c - d**) (try T-section)
Max. Compressive force = 314.85 KN
Max. Tensile Force = 179.1 KN

d) Design of inclined strut member (**b-B**) (try angle-section)
Max. Compressive force = 121.05 KN
Max. Tensile Force = 66.9 KN
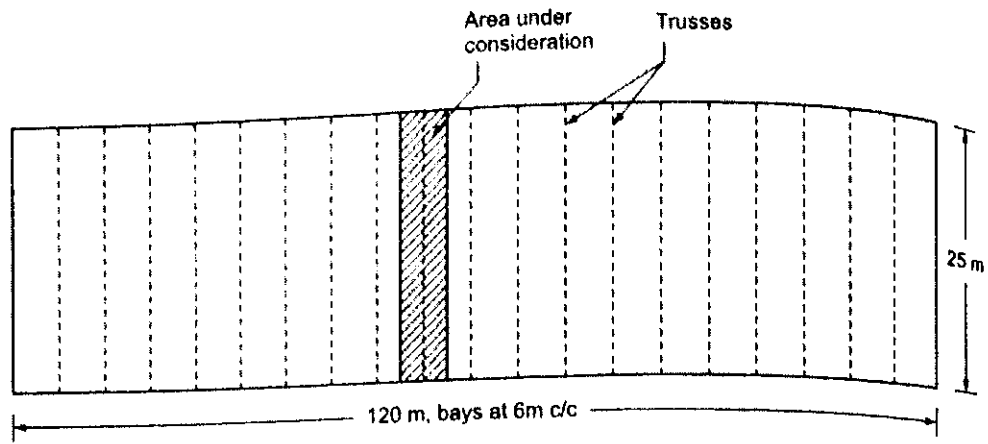
Number of bays $= \dfrac{120}{6} = 20$ Nos.
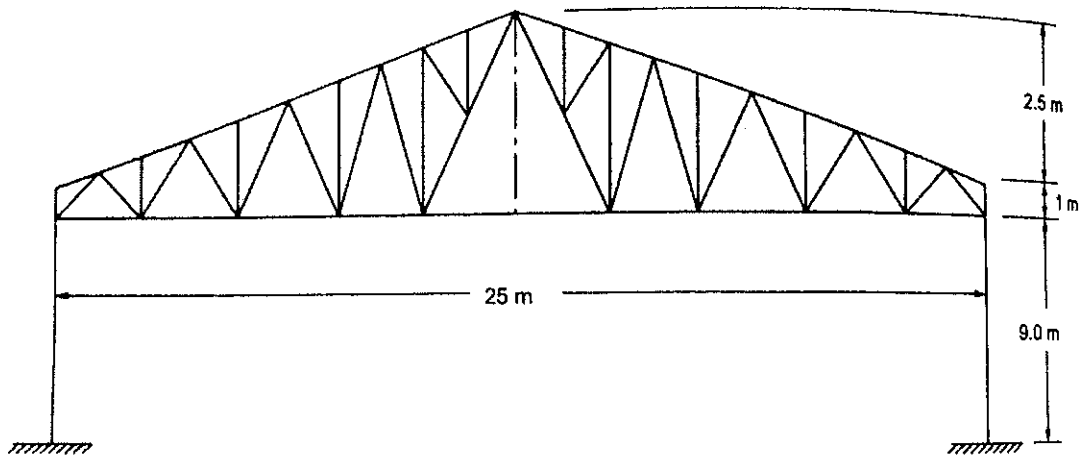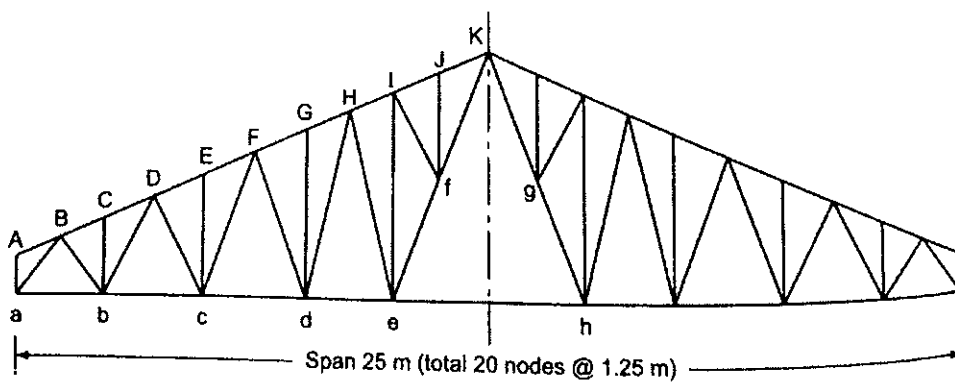

Fig. 9.7 Plan of industry

Fig. 9.8 Elevation

Figure: Layout of an industrial building roof truss