

Any Data Missing can be Reasonably Assumed. All Sketches Should be Clear. Material of Construction is Mild Steel 37

Q1): Design a Suitable Section for the Column "A-B" Shown in Figure (1) as a Rolled Section if The Design Straining Actions of the Column are Equal to $M_D = 15t.m$, $Q = 5.0t$ and $N_D = 60t$. (Side Sway is Prevented) [10 –Marks]



[10 –Marks]

[15 – Marks]



Diagram of a square reinforced concrete column cross-section. The column is square with side length $a = 60.0 \text{ cm}$. It contains 12 reinforcement bars: 4 bars in the top layer ($3\Phi 16\text{mm}$), 4 bars in the bottom layer ($3\Phi 16\text{mm}$), and 4 bars in the middle layer ($2\Phi 16\text{mm}$). The concrete has a strength class Bf1 No.400. The column is shown with a height of 500 cm.

- Advantages of Composite Actions in Composite Steel Structures?.
- Function of Shear Connectors in Composite Steel Structures ?
- State Briefly the Solutions or Treatments if the Length of the Anchor Bolts in Fixed Base Connection Exceeds the Depth of Concrete Foundation ?
- Disadvantages Of Composite Steel Columns ?
- At Fixed Support, why the Anchor Bolts are fixed in Base Plate Adjacent at both outside of the Column Flanges ?

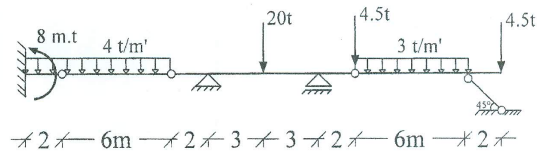
Examiner
Prof. Dr. Saad Eldeen Abd-Rabou



problem (1) :(14 marks)

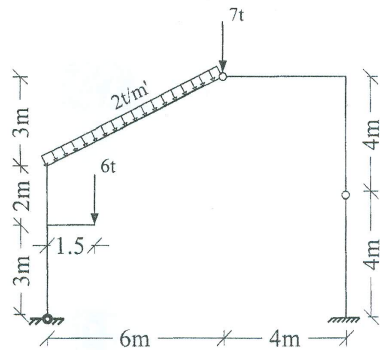
For the shown beam:

-Draw S.F.D & B.M.D.



problem (2) :(22 marks)

For the shown structure ,draw N.F.D , .S.F.D .and B.M.D .

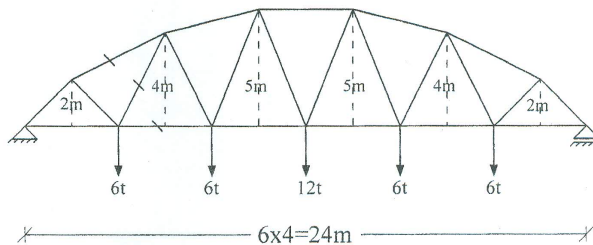


problem (3) :(18 marks)

For the shown truss :

-Find graphically the force in all members (.stress diagram.)

- Check the force in the marked members analytically .



with my best wishes Dr.Salah EL-Bagalati