EL-Mansoura University Faculty of Engineering

Final Examination.

Time: 3 - Hours

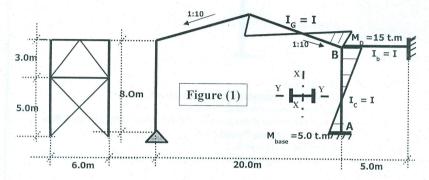
بسم الله الر BCE. Program Steel Structures (II) Date: 18/12 / 2017

Answer All Questions: (Max. grade 50 - Marks)

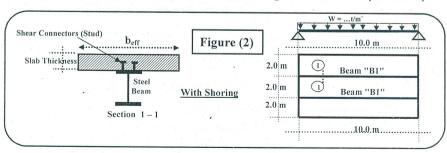
Any Data Missing can be Reasonably Assumed. Material of Construction is Mild Steel 37 All Sketches Should be Clear.

Answer All the Questions:-

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]

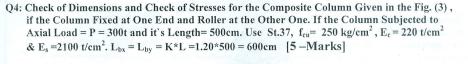


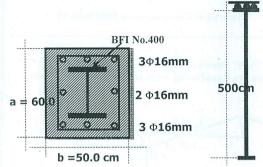
- Q2: Design the Fixed Base Connection "A" of the Frame Shown in Figure (1), if the Column Section is IPE No. 550 . The Straining Action at Base are M=5.0 t. m , H=6 t and N=60 t. For R. C. Foundation, $f_{cu}=350$ kg/cm², $F_{all.\ Contact\ Stress}=110$ Kg/cm²). Using Steel 36/52 in Fabricating the Anchor Bolts, then $F_{u.\ st.}=F_{u.\ bolt}=5.2$ t/cm², $f_{all.\ sh.}=(0.25*F_{u.\ bolt}*0.85)$. $f_{all.\ Weld}=0.2F_{u.\ [10-Marks]}$
- Q3): For the Construction of Composite Beam"B1" (<u>With Shoring</u>) Given in Figure (2), It is Required: (i): Choice the Dimensions of the Composite Section, (ii): Check for Stresses, (iii): Draw Stress Distribution on the Composite Cross Section, and (iv) Design the Required Shear Connectors to Connect Steel Beam with R.C. Slab. The Loads Acting on the Composite Beam are: Slab Thickness = 20 cm, Own Weight of Steel Beam = $W_{0.\text{w}}$ = 300 kg/m', W_{Covering} = 150 kg/m², W_{Wall} = 400 kg/m' and $W_{\text{L,L}}$ = 400 kg/m² [15 –Marks]



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P.T.O.





Q5): Variant Questions: [10 -Marks]

- > 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?

With Best Wishes

Examiner Prof. Dr. Saad Eldeen Abd-Rabou



Mansoura university

Faculty of engineering

Building & Construction Eng. Program Course Title: Structural Analysis 1



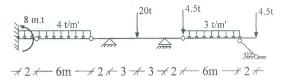
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Date: 1/1/2018 Final Term Exam Total Marks:50 Time Allowed: 2 hours

problem (1):(14 marks)

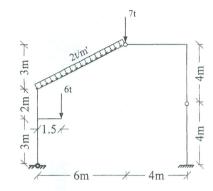
For the shown beam:

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



problem (2):(22 marks)

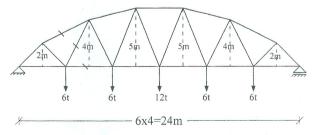
For the shown structure ,draw N.F.D , .S.F.D .and B.M.D .



problem (3):(18 marks)

For the shown truss:

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



with my best wishes Dr.Salah EL-Bagalati