

Registration No:

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Total Number of Pages : 01

M.TECH

M.TECH 2ND SEMESTER REGULAR EXAMINATIONS, MAY 2018

ADVANCED STEEL STRUCTURES

Branch: SE, Subject Code:MSEPE2042

Time: 3 Hours

Max Marks : 70

PART-A**(10 X 2=20 MARKS)****1. Answer the following questions.**

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| a. What is the importance of structural integrity? How it can be achieved? | CO1 |
| b. How are residual stresses induced in steel structures? | CO1 |
| c. What is inelastic buckling? | CO1 |
| d. Which section performs best in torsion & why? | CO1 |
| e. Define laterally restrained beam. | CO4 |
| f. Define 'Block shear'. | CO2 |
| g. Explain the term, <i>plastic hinge</i> ? | CO4 |
| h. Define <i>shear center</i> . | CO1 |
| i. State the important loads considered in the design of a <i>gantry girder</i> . | CO4 |
| j. In what situation, unsymmetrical bending takes place? | CO2 |

PART-B**(5 X 10=50 MARKS)****Answer any five questions from the following.**

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| 2. a. Determine the moment carrying capacity & shear strength of a laterally unrestrained ISMB500 member of length 4m. Yield strength of steel is 250 Mpa. | (5) | CO3 |
| b. An ISMB 400 transfers an end reaction of 150 KN and end moment of 75 KNm to the flange of an ISHB 300 @ 577 N/m. Design the moment resistant connection. | (5) | CO4 |
| 3. a. Design a welded splice for an ISMB 300 section to transfer a factored bending moment of 90 KN-m and a shear of 50KN. Assume the flange splice carries all the moment & that the web splice carries only the shear. | (5) | CO3 |
| b. Compute the moment carrying capacity of laterally restrained beam ISMB 500 of length 5.0 m and yield strength of steel 250 MPa. | (5) | CO3 |
| 4. a. Differentiate between web buckling and web crippling. | (5) | CO3 |
| b. Show the residual stress distribution in hot rolled I section and channel section. | (5) | CO2 |
| 5. a. What are the advantages and disadvantages of welded connection? | (5) | CO4 |
| b. Design a double angle strut to carry an axial factored load of 240 kN. The length of strut is 3.0m. Bolted connections are to be used to connect it to 12 mm gusset plate. | (5) | CO1 |
| 6. a. Calculate the load carrying capacity of strut consisting of 2 ISA 60 x 60 x 10 placed back to back if length of the member is 3m and its welded to gusset plate of 12mm thickness. | (5) | CO1 |
| b. Discuss on Equivalent Moment Factor. | (5) | CO1 |
| 7. a. Explain lacing and battening of steel column with diagram. | (5) | CO4 |
| b. Explain step by step procedure to design of gantry of girders. Also explain the loads considered in the design. | (5) | CO4 |
| 8. Write short notes on:(5x2) | | |
| a. Shear lag | | CO1 |
| b. Beam-Column splices | | CO3 |