Registration no: | | | | | | | | | | |

Total Number of Pages: 02 **M.TECH**
CEPE208

2ndSemester MTech Regular/Back Examination – 2014-15
ADVANCED STEEL STRUCTURES
BRANCH(S):CIVIL ENGINEERING
Time: 3 Hours
Max marks: 70
Q.CODE:T505

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

a) Cold drawn section
b) Stress concentration
c) Shape factor
d) Lug angle
e) Bearing stiffener
f) Tension field action
g) Plastic hinge
h) Prying force
i) Compact section
j) Torsional rigidity

Q2 a) What is residual stress? How it can be reduced? (5)
b) Show the residual stress distribution in hot rolled I section and channel section. (5)

Q3 A portal frame ABCD is fixed at A and D. The columns AB and DC are of 5.0m each and beam BC is 4.0 m. A point load of W acts at midway on BC. Compute the collapse load W if plastic section modulus of columns are M_p and for beams it is $2M_p$. (10)

Q4 a) Differentiate between web buckling and web crippling (5)
b) Compute the moment carrying capacity of a laterally restrained beam ISMB 500 of length 5.0 m and yield strength of steel 250 MPa. (5)

Q5 Design an 18 –m long simply supported welded plate girder carrying a uniformly distributed load of 50 KN/m excluding self-weight and two concentrated loads of 350 KN each at quarter points of the span. The girder is laterally unsupported. (10)

Q6 Design a column of length 3.75m if it carries a compressive load of 500 KN and a moment of 5 KNm. The column is fixed at the base and pinned at the top. (10)

Q7 Design a bolted end plate connection between an ISMB 300 beam and an ISHB 200 column to transfer a vertical factored shear of 120 KN and a factored hogging moment 120 KNm. (10)

Q8 Design the base plate for an ISMB 500 column to carry a factored load of 1500 KN and 50 KNm moment using 410 grade steel and M25 grade concrete. (10)