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B.E. (Civil Engineering) Fifth Semester
CIV-501: Steel Structure Design – I

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt* <u>*five*</u> *questions in all, including Question No. 1 (Part-A) which is compulsory and selecting two questions each from Part B-C. Assume missing data suitably, if any. Use of IS:800-2007, Steel Table and IS:875-1984 is allowed.*

x-x-x

PART-A

a) Draw the sketch of Fillet weld.
b) What is the efficiency of a joint?
c) Explain the effect of effective length of compression member on its load carrying capacity.
d) How net sectional area of a tension member will affect its load carrying capacity.
e) Draw sketches of bolted framed connects.
f) What do you understand by laterally supported and laterally un-supported beams?
g) Draw the sketch of Gusseted Column Base.
h) What do you mean by web crippling?
i) What is the function of Lacing in columns?
j) Draw stress-strain curve of mild steel.

(10x1=10)

PART-B

Find the efficiency of the single cover butt joint shown in Fig., use 20mm dia. bolts   (10)
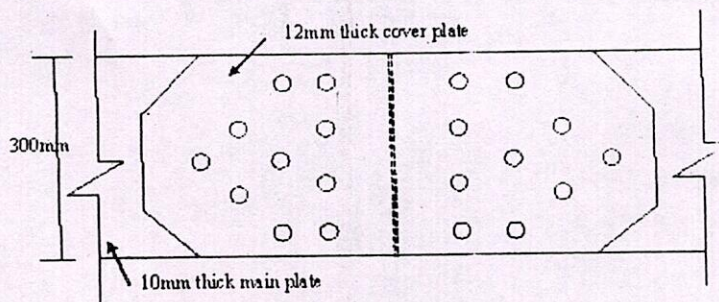
Design a laterally un-supported beam with simply supported ends of effective span 6m   (10)
subjected to a working load of 40 kN/m. Assume that full torsional and warping restraints are provided at the supports and the load acts on the upper flange which will have destabilizing effect.

a) Advantages and Disadvantages of welded connections.   (4+6=10)
b) Explain design procedure for design of tension members.

P.T.O.

PART-C

5. Design a built-up channel section and Battens for a column of effective height 6m and a design load of 2000 kN.

6. Design the Bolted connection and member BD of a roof truss meeting at a joint B. The member BD is perpendicular to member BA & BC. Design loads for the members are as:

Member	Length	Force
BA	2m	-150kN
BC	2.5m	-100kN
BD	1.5m	-20kN & +150kN

    (+ve = Tensile, -ve = Compressive)

7. Design a Gusseted base for a column consisting of ISHB 400 @ 82.2 kg/m, with 20cm x 1.0cm flange plates, one on each flange. The column catties a working load of 1000 kN and a moment of 200 kNm. The column is supported on concrete pedestal of M20 grade. Also design the Concrete pedestal if Bearing Capacity of the soil is 150 kN/m^2.

x-x-x