Final Examination 2013-2014

Q1/ For the sidesway unprevented steel frame shown in Fig. 1, the material of columns and girders is ASTM A992. The loads shown at each level are the accumulated dead loads and live loads at that story. Design a W steel section for column AB assuming inelastic behaviour if the column is pinned at the base about the x-x axis of the column. Assume columns AB and BC have same section size and the column are continuously supported in the transverse direction (the y-y axis). Also design a rectangular base plate with A36 steel and $f_{ce} = 3 \text{ksi}$ for the 12\text{ft} x 12\text{ft} concrete footing.

![Figure 1](image1)

25 Marks

Q2/ Using the AISC Specifications, determine the fillet weld size required by LRFD method for the connection shown in Fig. 2. Assume E70 electrodes to be used and the SMAW process. Use both the elastic method and the ultimate strength method tables in Part 8 of AISC Manual.

![Figure 2](image2)

25 Marks