



# IQRA NATIONAL UNIVERSITY, PESHAWAR

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## DEPARTMENT OF CIVIL ENGINEERING

Semester (7th) Final Term Examination (*Summer Semester 2020*)

**Subject: Steel Structures**

**(Course Code): CE-413**

**Duration: 09:00---13:00**

**Instructor: Amjad Islam**

**Total Marks: 50**

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**Note:** Attempt all questions. Assume any necessary data, if required.

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Q1: Select the lightest W shape of A-36 steel column of 36 ft long to carry a dead compression load of 60 k and a live compression load of 110 k. Assume that the column is pin-supported at the top and bottom in both directions and that an additional support provided at the mid-length to prevent buckling about y-axis so that  $K_x L_x = 36$  ft and  $K_y L_y = 18$  ft. Use AISC/LRFD method. (20)

Q2: Determine the lightest W section to support concentrated loads of 1.5 kips dead load and 4.5 kips live load at each quarter point of a 52-ft simple span. The beam is laterally supported at the ends and at the points of load application. Live-load deflection is limited to  $1/360$  of the span.  $F_y = 36$  ksi. Use AISC/ASD method. (15)

Q3: Determine an A-36 double-angle tension member 18ft long to transfer 50k Dead load and 150k Live load. The connection is bearing type with A325 bolts with  $\frac{3}{4}$  -in diameter (standard holes) with threads not excluded from the shear plane. Use two lines of bolts. Use ASD method. (15)