COURSE CODE(CREDITS): 18B11CE612 (3)   MAX. MARKS: 35
COURSE NAME: Design of Steel Structures
COURSE INSTRUCTORS: Mr. Kaushal Kumar   MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets. IS800-2007 and Steel Table is allowed.

Q1. A plate section 8 mm thick and 150 mm wide carrying 120 kN factored load is to be connected to a gusset plate (lap joint) using M20 bolts of grade 4.6. Find the number of bolts required and sketch the connection details.   *CO-1, CO-2* [5 Marks]

Q2. A circular shaft of dia. 150 mm is welded to a rigid plate by an external all round fillet weld of size 10 mm. If a torque of 10 KN is applied to the shaft. Find the maximum stress in the weld.   *CO-1, CO-2* [5 Marks]

Q3. Find the block shear strength of the section shown in figure below. M20 bolts are used.
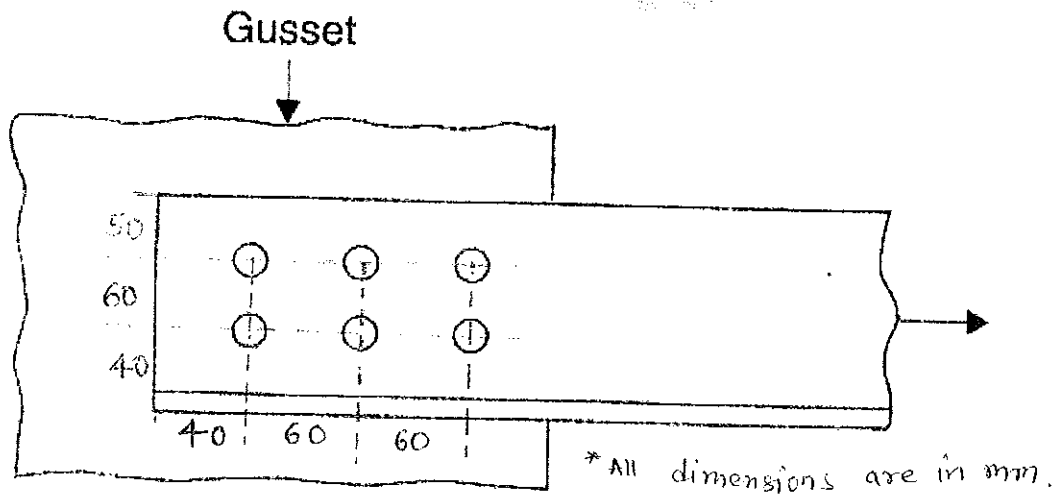
CO-1, CO-3 [5 Marks]

Q4. Determine the load carrying capacity of a strut made with ISA 100x75x10 mm, if length is 2.8 m in the case of end connections:- two bolts used *CO-1, CO-4* [5 Marks]

Q5. A steel column ISHB 250 @ 537 N/m supports a total factored load of 800 kN. Design a slab base for the column. The column is supported on a pedestal made of M20 concrete.   *CO-3, CO-4* [5 Marks]

Q6. Design a simply supported beam of 9 m effective span carrying a factored load of 50 kN/m including the self weight of beam. The depth of the beam should not exceed 500 mm. The compression flange of the beam is laterally supported. Assume stiff end bearing is 80 mm. Also, Check for shear, deflection, web buckling and web crippling.   *CO-5* [10 Marks]

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