

III B. Tech II Semester Regular/Supplementary Examinations, October/November - 2020
DESIGN AND DRAWING OF STEEL STRUCTURES

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: i) Answer any ONE Question from Part – A and any THREE Questions from Part – B
ii) Use of IS 800:2007, IS: 875 (Part III)-1987, structural steel tables are to be permitted in the examination hall.

PART –A

- 1 Design a welded plate girder for a simply supported bridge deck beam with a clear span of 18 m. Dead Load including self weight = 20 kNm and imposed load = 10 kNm. Two moving loads of 100 kN each spaced 2 m apart. Assume the top compression flange of the plate girder is restrained laterally and prevented from rotating. Design as an unstiffened plate girder with thick welds. Draw the plan and sectional elevation. [28M]
- (OR)**
- 2 Design a column of effective length 6 m. It is subjected to a factored axial compressive load of 2100 kN. Provide two channels back to back connected with battens by site welded connection. Draw to scale the cross-section and sectional elevation of the column with batten details. [28M]

PART -B

- 3 Design a connection to joint two plates of size 200 mm x 10 mm of grade Fe 410 to mobilize full plate tensile strength using shop fillet welds if (i) a lap joint is used (ii) a double cover butt joint is used. [14M]
- 4 Design a continuous beam of span 5.0 m, 6 m and 5.0 m carrying a total uniformly distributed load of 30 kN/m and laterally unrestrained with a bearing length of 100 mm. [14M]
- 5 Design a bridge truss diagonal subjected to a factored tensile load of 400 kN. The length of the diagonal is 3.0 m. The tension member is connected to a gusset plate 16 mm thick with one line of 20 mm diameter bolts of grade 8.8. [14M]
- 6 A column ISHB 350 @661.2 N/m carries an axial compression factored load of 1500 kN. Design a suitable welded gusset base. The base rests on M-15 grade of concrete. [14M]
- 7 a) What are the advantages of parallel chord trusses? [5M]
 b) Why is it necessary to design truss members for both compression and tension forces? [5M]
 c) What are the load combinations that are usually considered for truss analysis? [4M]
