

Code No: RT32013

R13**SET - 1**

III B. Tech II Semester Supplementary Examinations, November - 2017
DESIGN AND DRAWING OF STEEL STRUCTURES
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Answer any ONE Question from Part – A and any THREE Questions from Part – B
Use of IS 800-2007, IS-875 Part 3, Steel tables is to be permitted

PART –A

- 1 Design a welded plate girder to carry a superimposed load of 60 kN/m and two concentrated loads of 300 kN each at one third points of the span. The effective span of the plate girder is 24m. Assume that the girder is laterally supported throughout its length. The yield strength of the steel (of both the flanges and the web), $f_y = 250$ MPa. Draw to scale the longitudinal and cross section of the girder. [28M]
- 2 Design a gusseted base for a column section ISHB 350 @ 724 N/m subjected to an axial load of 2800 kN. The base rests on a M15 concrete pedestal. The safe bearing pressure of concrete may be assumed to be 4000 kN/m². draw to scale the plan and elevation of the gusset base. [28M]

PART -B

- 3 Design a splice using bolts for a beam column 5 m high subjected to a factored axial load of 600 kN at an eccentricity of 125 mm along the minor axis. Assume that the ends of the beam column are milled for complete bearing. The section of the beam column is HB 400. [14M]
- 4 Design a connection to join two plates of size 300 x 8 mm in Fe410 grade steel to mobilize the tensile strength of the plate using site fillet welds. (a) a lap joint is used and (b) a butt joint is used. [14M]
- 5 Design a built-up column of the effective length of 6 m to carry an axial load of 1000 kN using battening. Design the connections using fillet welds. The grade of the steel is E250. [14M]
- 6 An industrial unit with medium permeability having designed life of 50 years is to be set up at Nagpur. The land at the site is generally plain and surrounded by small industrial buildings. The overall lengths with width of building are 55 m and 20 m, respectively. The centre to centre spacing of 9 m high roof columns is 6m; centre to centre distance between columns along the width of the building is 19.5 m. Rise to span ratio of truss is specified as 1/5. Determine the external and internal air pressure and design wind pressure. [14M]
- 7 Explain the different modes of failures of tension members and compression members. [14M]
