

[4]

Write short notes on :

- i) Airy's Theory of design of Silo
- ii) Design theory of Towers.

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**CE-803**

**B.E. VIII Semester**

Examination, December 2016

**Advanced Structural Design - II (Steel)**

*Time : Three Hours*

*Maximum Marks : 70*

- Note:** i) Attempt all questions.  
ii) There is an internal choice between questions.  
iii) Assume any missing data if required.  
iv) Use of relevant IS code is permitted.

1. What do you understand by Deck type Plate girder? Design a deck type plate girder bridge for single track main line B.G. loaded as data given below :

Effective span = 25m

Spacing of plate girder = 1.9m c/c

Weight of stock rails = 260 N/m

Weight of guard rails = 290 N/m

Weight of fasteners etc. = 300 N/m of track

Timber sleepers = 250m × 150m 2.7m @ 0.5m c/c

Density of timber = 7.4 kN/m<sup>3</sup>

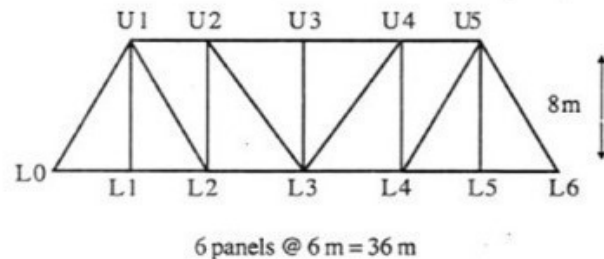
Take permissible stresses as per railway steel bridge IS code.

OR

[2]

Design the section of Plate girder to carry a superimposed load of 150 kN/m of an effective span of 24 meters. Take impact factor = 0.4. Also design the end bearing stiffeners.

2. Design the Pratt truss as shown in figure is to be used as one of the two main girders of a single track bridge carrying rolling loads on stringers which in turn are carried by cross girders connected to nodes of the truss. The truss center lines are 6m apart while a pair of stringers divides this distance into three equal parts of 2m each. Dead load on each truss is 30 kN/m and uniformly distributed live load on each truss is 75 kN/m and impact factor is 20%.
- Draw influence lines for the forces in the members L1, L2 and U2 U3.
  - Design the sections for the members L1 L2 and U2 U3.



OR

Write detail notes on :

- Roller bearing
- Rocker bearing

[3]

3. Design an elevated cylindrical steel tank with hemispherical bottom for 3,00,000 liters capacity. The tank has conical roof. The ring beam of the tank is at height of 14m from the ground level. The tank is to be built at Bhopal City. Design up to conical roof beam. Also design the connections. Assume yield stress of steel is 250 MPa.

OR

Write design steps with all technical details of Pressed Steel Tank.

4. Design a Steel Chimney (Self supported) of height 45m above the foundation and having its diameter at top is 3.5m thickness of brick lining is 115mm and this is supported by the chimney shell through the height. Chimney is situated in Bhopal city. The topography of the site is flat and the location of the terrain category 2. Compute wind loads on different zones of Chimney and design plates of the lowest zone.

OR

Design a Self supporting steel stack for Indore city having a height of 60m above the foundation and the diameter of cylindrical part is 4.25m Foundation is raft resting on medium soil. Assume any suitable data if needed.

5. Design a circular silo of 16m height and 4m internal diameter to store Coal material of bulk density 18 kN/m<sup>3</sup> and angle of internal friction is 29 degree.

OR