

BE. /B.Tech. 7th Semester (Civil Engg.)

Examination, December-2013

DESIGN OF STEEL STRUCTURES-II

Paper- CE-401-E

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions. All questions carry equal marks. Use of IS 800-1984 or 2007 is allowed. Use of Steel Table is allowed.

1. (a) Obtain the length and profile of a plastic hinge for a simply supported beam subjected to a uniformly distributed load. 10
- (b) A simply supported beam of uniform cross section and span $2L$ is propped at the centre. Find out the collapse load if, 10
 - (i) A concentrated load is applied at the centre of the left hand span.
 - (ii) Equal concentrated loads are applied at the centre of each span.
2. A member of a riveted truss consists of two angles connected back to back with a gap of 15mm. The axial

force in the member is 30 kN (Comp.) due to dead load, 65 kN (Comp.) due to live load and 55 kN (tens.) due to wind load. The distance between the centers of end connections is 3.5m. Design the member and the end connection. 20

3. Design a rectangular tank of capacity 1,10,000 liters of water supported over a 12m high staging. Columns are supported over concrete pedestal of M-15 Concrete. The bearing capacity of soil is 100kN/m^2 . Design wind pressure may be assumed to be 1.05 kN/m^2 . Plates of 1.25 width and 8.75 m length are available. 20
4. Design a self supporting steel stack having a height of 90m and 4m in diameter. It is to be constructed in Delhi. The bearing capacity of soil is 140kN/m^2 . The necessary relevant data may be assumed. 20
5. What are the classifications of tower ? What are the design loads to be considered ? Explain. 20
6. Explain the local buckling in cold formed sections. Also explain the concept of effective width and effective sections. 20

7. Explain the following terms :

4×5=20

- (a) Flexural Member
- (b) Purlins
- (c) Cold formed section
- (d) Transmission towers.

8. Explain the following terms :

4×5=20

- (a) Plastic collapse
- (b) Steel stacks
- (c) Ultimate load carrying capacity
- (d) Concept of effective width for cold formed sections.