

**CE - 803****B.E. VIII Semester**

Examination, June 2016

**Advanced Structure Design - II (Steel)***Time : Three Hours**Maximum Marks : 70*

**Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define welded plate girder bridge.  
b) Discuss the overturning effect on the girder.  
c) Discuss the half-through plate girder bridge for railways.  
d) A deck type welded plate girder railway bridge is to be designed for B.G single line track on the main line. The following data is available:

Effective span = 20m, c/c distance between girders = 2.2m

D.L on each girder =  $220L + 600$  N/m

D.L of track with sleepers = 7000 N/m

Lateral load = 9000 N/m

Design the mid section of the girder

OR

Design bearing stiffener for above welded plate girder.

2. a) Define open web girder bridges with sketches.  
b) Discuss elastomeric bearing.  
c) Discuss economical proportioning of truss bridge.  
d) An open web girder bridge consists of two pratt trusses 16 panels @ 4m c/c = 24m. The bridge supports an equivalent uniformly distributed live load of 180kN per m run. The D.L. transmitted to each truss inclusive of self weight is 16kN/m. Design any top chord member of truss. Assume the impact factor to be 15%

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OR

Design any diagonal member for the above girder bridge.

3. a) Define stand-pipe. Draw diagram.  
b) Discuss the function and arrangement of back stay in pressed steel tank.  
c) Derive the expression for radial stress in spherical bottom of water tank.  
d) Design a circular elevated water tank for a capacity of 250 KL. The tank is supported over eight columns. Design conical roof, cylindrical portion and bottom hemispherical bottom plates.

OR

Design a rectangular tank of capacity 110 kL of water. Plates of 1.25 m width and 8.5 m length are available. Design bottom plates and Tee covers.

4. a) State the recommendations for height of stack.  
b) Discuss the purpose of chimney lining.  
c) Discuss the calculation of stresses due to earthquake loads on the chimney.  
d) Design the chimney shell for a self supporting steel stack of height 70m above foundation for the following data: Diameter of cylindrical part = 3m, diameter at the base of flared part = 5.0m, height of flared part = 20m. Take wind pressure =  $0.90 \text{ kN/m}^2$  uniform throughout the height of stack.

OR

Design the breech opening and base plate for above stack.

5. a) Discuss the silos.  
b) Discuss the components of bunker.  
c) Discuss design of stiffness of bunker.  
d) A circular steel silo of 12m height and 4m internal diameter stores cement of bulk density  $16 \text{ kN/m}^3$ . The angle of internal friction is  $25^\circ$ . The mean size of the particles be assumed to be less than or equal to 0.06mm, design the cylindrical portion.

OR

Design the hopper portion of above Silo.

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