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EKS-347

**B.E. VIII Semester (CGPA) Civil Engg.
Examination 2017**

ADVANCED STRUCTURAL DESIGN - II (STEEL)

Paper : CE-802

Time Allowed : Three Hours

Maximum Marks : 60

- Note :** i) Attempt all questions.
ii) All questions carry equal marks.

Q.1. Write down the design steps of half through type plate girder bridge for railways. 12

OR

Design a deck type welded plate girder bridge for railways for B. G. single line track on the main line.

effective span = 28m, C/C distance between girders = 2.2m,
D.L. on each girder = 800 N/m, D.L. of track with
sleepers = 7000 N/m, Lateral load = 9000 N/m. Design the
mid section of the girder.

Q.2. Discuss the following :

- a) Elastomeric bearing.
- b) Discuss economical proportioning of truss bridge.
- c) Open web girder bridge.

OR

Design a roller bearing for a bridge with given data :

Vertical load due to DL + LL + impact = 950 kN

Vertical load due to wind = 250 kN

(at each end of girder)

Lateral load due to wind at each bearing = 65 kN

Longitudinal load per girder = 350 kN

Permissible stresses on M.S. pin are 100 MPa in shear, 208 MPa in bearing and 208 MPa in bending.

Permissible bending stress for base plate is 185 MPa and safe bearing pressure on concrete is 5000 kN/m.

Q.3. Design an elevated cylindrical steel tank with hemispherical bottom for 2,00,000 litres capacity. The tank has conical roof. The ring beam of the tank is at a height of 12 m from the ground level. The tank is to be built at Delhi. Design upto conical roof beam and top ring angle.

Take $f_y = 250 \text{ N/mm}^2$

12

OR

Design a circular elevated water tank for capacity of 250 kL. The tank is supported over eight columns. Design conical roof, cylindrical portion and bottom hemispherical bottom plates.

(3)

- Q.4. Design the chimney shell for a self supporting steel stack of height 70 m above foundation with following data :
- Diameter of cylindrical part = 3 m,
 Diameter at the base of flared part = 5.0 m,
 Height of flared part = 20 m,
 Take wind pressure = 0.90 kN/m^2 uniform throughout the height of stack. 12

OR

Discuss :

- Guyed Chimney
- Calculations of loads for a chimney
- Lining of chimney

- Q.5. Design the walls of a circular steel silo of 12 m height and 4 m internal diameter to store cement of bulk density 15.0 kN/m^3 . The angle of internal friction is 25° . The mean size of particle is assumed to be less than 60μ . 12

OR

Discuss :

- Silos
- Components of bunker
- Design of stiffness bunker

