Roll No .....

MVSE - 104

M.E./M. Tech., I Semester

Examination, June 2014

Design of Concrete Structures

Time : Three Hours

Max. Marks : 70

Note: i) Attempt any five questions. All questions carry equal marks.
ii) Use of relevent IS code, IRC publications and tables are permitted.
iii) Sketch the design details.
iv) Missing data if any may be suitably assumed.

1. a) What do you mean by ductility of a building? How it can be increased?
   b) Describe the various provisions that are to be taken care for earth work resistant R.C.C. frame structures as per IS 13920.

2. Compute the moment along longer and shorter span of the interior panel of a flat slab 5.6m×6.6m in size, for a super imposed load of 7 kN/m².

3. Compute the maximum bending moment for a solid slab bridge for IRC class AA tracked vehicle loading for the following data.
   i) Clear span = 8.5m
   ii) Clear width of roadway = 8.0m
   iii) Av. thickness of wearing coal = 80mm
   iv) Width of bearing = 500 mm

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4. The diameter and height of cylindrical wall of an INTZE TANK are 9.5m and 6.5m respectively. The top dome rise is 1.6m while the bottom dome rise is 1.2m. The height of conical dome is 2m and diameter of bottom ring beam is 6m. Design the top dome, top ring beam and middle ring beam. Assume the thickness of cylindrical wall as 250 mm.

5. Design a bridge beam simply supported over a span of 30m and carrying super imposed load of 12kN/m. Assume permissible stress in concrete and minimum stress is zero. Assume 20% loss of prestress. The section in post-tensioned with 5mm dia wire cables, each consisting of 12 wires. Allowable stress in wire 960 N/mm². (Use limit state approach)

6. a) Sketch the layout of tendons of a PSC continuous beam
      i) Straight
      ii) Curved in elevation
   b) Explain circular prestressing and construction details of a circular container.

7. Distinguish between a Bunkers and a silo. Design the side wall of a bunker to store 300kN of coal for the following data.
   i) Unit at of Coal = 8kN/m²
   ii) Size of bunker = (3.3 × 3.3)m with hopper of 1.30m high with a central hole of size (0.5m × 0.5m)
   iii) The stored coal is to be surcharged at its angle of repose = 30°.

8. Discuss in detail of the following
   i) Battery of bunkers
   ii) Indeterminate pre-stressed concrete structures.
   iii) Composite construction
   iv) Grid floor design

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