B. Tech Degree VIII Semester Examination, April 2008

CE 803 A/B (a) ADVANCED DESIGN OF STRUCTURES
(2002 Scheme)

Time : 3 Hours   Maximum Marks : 100

(Use of IS:456-2000, SP:16, IRC Codes are permitted)

I.   Design the exterior panel of a flat slab 5 m x 5 m in size, for a super-imposed load of 7.75kN/m². Use M20 concrete and Fe 415 grade steel. Show the reinforcement details.   (30)

OR

II.   Design a chimney of 60 m height, having external diameter of 4 m through out the height. The chimney has fire brick lining of 100 mm thickness, provided upto a height of 40 m above ground level, with an air gap of 100 mm. The temperature of gases above surrounding air is 200°C. Take the coefficient of expansion of R.C.C as 11×10^{-6} per degree C, and $E_s = 2.05 \times 10^5 \, N / mm^2$. Use M25 grade concrete mix.   (30)

III.   Design a spherical dome over a circular room, for the following data.

         Inside diameter of room   =   20 m
         Rise of dome   =   4 m
         Live load due to wind   =   1.5kN/m²

The dome carries a lantern load of 30kN attached at the circumference of an opening of 2m diameter at the apex. Use M20 concrete and Fe 415 steel show reinforcement details.   (35)

OR

IV.   Analyse the V-shaped folded plate shown in figure. Take the span as 20m. Also design the reinforcement. Show reinforcement details. Use M20 concrete and Fe 415 steel.   (35)
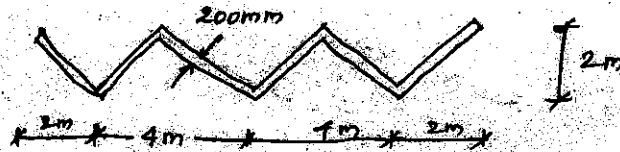
Take
L.L = 1.5 kN/m²

V.   Design a deck slab for the following particulars.

         Clear span   =   5.5 m
         Width of footpath   =   1 m on either side
         Wearing Coat   =   100 mm
         Loading   =   IRC class AA (Tracked)
         Materials   =   M25 grade concrete and Fe 415 grade steel
         Road width   =   7.5m

Show reinforcement details.   (35)

OR

VI.   Obtain Courbon's reaction factor and the maximum bending moment in case of T-beam bridge having the following data.

         Roadway   =   2 lanes
         Loading   =   IRC Class A
         Number of main guiders   =   3
         C/c spacing   =   2.6 m
         Span of the bridge   =   16 m
         Kerb width   =   600 mm on either side.   (35)

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