

College of Engineering, Pune (COEP)

End Semester Examination

B. Tech: Advanced Design of Structures (Elective II)

Time: 3 hours

April 2013

Max. Marks: 100

Note:

1. All questions are compulsory.
2. Make suitable assumptions wherever required and state them clearly.
3. Detailing of the designed components/ structures to be shown properly.
4. Figures to the right indicate full marks.
5. Use of IS 456, IS 3370 and non-programmable calculator is allowed.

Q.1. Design a simply supported deep beam of 4 m span. It supports total load of 400 kN/m including self weight with overall depth of 4 m.
Width of support - 0.6 m, and Width of beam - 0.4 m.
Concrete - M 30, and Steel - Fe 415 HYSD bars. [25]

Q.2. A ten storey residential building in Mumbai (Zone III) has its lowermost columns 500 x 700 in size. In order to use the ground floor of 4 m height for car parking, the lower columns are made free standing (without infill walls). Provide the hoop reinforcement for interior columns including column beam joints, beams on all four sides are of 300 mm width and 500 mm depth. M25 and Fe 500. [25]

Q.3. Design a shear wall of 250 mm thickness and 8.0 m length, subject to the forces given in table. Height of wall is 3.5 m, provide boundary elements. Use M30 and Fe 500. [25]

Loading	Axial Force (kN)	Bending Moment (kNm)	Shear Force (kN)
DL	3120	960	160
LL	780	240	40
EQx	250	4800	700

Q.4. An Intze tank comprises of the following details: [25]
(i) Top dome rise - 2 m, (ii) Diameter of cylindrical portion - 12 m, (iii) Height of cylindrical wall - 8 m, (iv) Bottom dome rise - 1.6 m (v) Conical dome top diameter - 10 m, (vi) Conical dome bottom diameter - 8 m and (vii) M 25 and Fe 415.
Design the Bottom Ring Beam, Conical Dome and Bottom Dome.