

B.Tech. Degree VII Semester Examination November 2005

CE 702 A/B DESIGN OF STRUCTURES III (2002 Admissions)

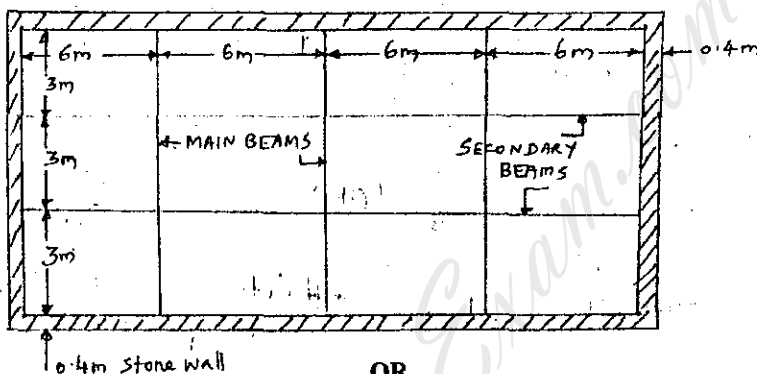
Time: 3 Hours

Maximum Marks: 100

(Use of IS 800, SP:16, IS 804, IS6553, IS 801, IS811, SP-6(1) Steel tables are permitted.

Assume missing data, if any suitably)

- I a) A hall measuring 9m x 24m from inside is provided with reinforced concrete slab resting on secondary beams spaced at 3m centre to centre. The secondary beams are connected to the web of main beams spaced at 6m centre to centre as shown in the figure. Design the secondary beams and main beams, taking a live load of 2KN/m². The thickness of roofing inclusive of the slab is 200mm.



(40)

OR

II Design the mid span section of a plate girder of effective span 20m carrying a load of 120 KN/m including its self weight. Also design the following parts:

- i) a web splice at 5m from the support
- ii) a bearing stiffener at the support

(40)

III The trusses for a factory building are spaced at 4.5m c/c and the purlins are spaced at 1.8m c/c (the pitch of the truss is 1/4 and the span of the roof is 10m. The vertical loads from roof sheets etc. are equal to 180 N/m² while the wind load on roof surface normal to the roof is equal to 1200KN/m². Design I section purlin. Take $\sigma_w = 165 \text{ N/mm}^2$.

(30)

OR

IV A column whose effective length is 10m has to support a load of 1000KN at an eccentricity of 100mm about the major axis. Design the column to resist the above load using an I section. Assume $f_y = 250 \text{ N/mm}^2$. Also design a suitable base plate for the column. Assume M_{20} concrete for the concrete pedestal supporting the base plate and the column. Also design the base plate and the column. Also design the concrete pedestal, if the SBC of soil = 150 KN/m².

(30)

V A self supporting chimney made up of steel plates has 60m height and the top diameter 3m. The height of the flared portion is 20m and the diameter of the chimney at bottom is 4.5m. The wind pressure is 2.0 KN/m². Design the thickness of plates at 20m and 40m from top. Design the base plate and anchor both. Design a suitable foundation if SBC of soil is 150KN/m².

(30)

OR

VI Design a cylindrical water tank with hemispherical bottom to have a capacity of 1,40,000 litres with a free board of 250mm. Height upto the top of column is 10m above ground level. 1.5m wide plates are available for fabrication. Take the diameter of tank in plan as 6m. Design of staging is not required.

(30)
