

## M.E. Civil Engineering - First Year - Second Semester

### Analysis and Design of Tall Structures

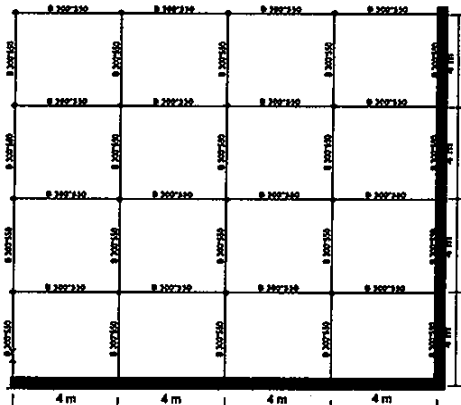
#### PART-I

Time: Three Hours

Full Marks 100

Use a separate Answer-Script for each part

[IS1893 is allowed only, assume any suitable data]

No. of questions	Part I (60 marks) (Answer 1 and Any three Questions)	Marks
1 (CO-1)	Consider a two storied building having mass at the first floor 100 Ton and ground floor 75 Ton. Stiffness of ground floor and 1 <sup>st</sup> floor are 10 and 15 Ton/m. The building is located at Kolkata (zone III). Determine the storey stiffness, frequencies and mode shapes and storey shear. Analyse with response spectrum method only.	20
2 (CO-4)	Explain the step by step procedure of push over analysis according to any code with relevant diagram.	13
3 (CO-1)	What is the basic philosophy of ductile detailing according to IS 13920 2016. Draw briefly ductile detailing of a flexure member and explain probable cause for recommending these arrangements.	13
4 (CO-3)	Write a note on different structural form of tall structure.	13
5 (CO-3)	 <p>Consider the shear wall system for 1 story building of height 5m and 4m upto roof and 1m from parapet having thickness of wall 150 mm. Each column have dimension 400X400mm which is situated at each grid (except shear wall portion). Determine the torsional moment considering design and accidental eccentricity if it is situated in zone IV and roof weights are 5kN/m<sup>2</sup>.</p>	13

[ Turn over

M.E. CIVIL ENGINEERING  
FIRST YEAR  
SECOND SEMESTER EXAM 2025

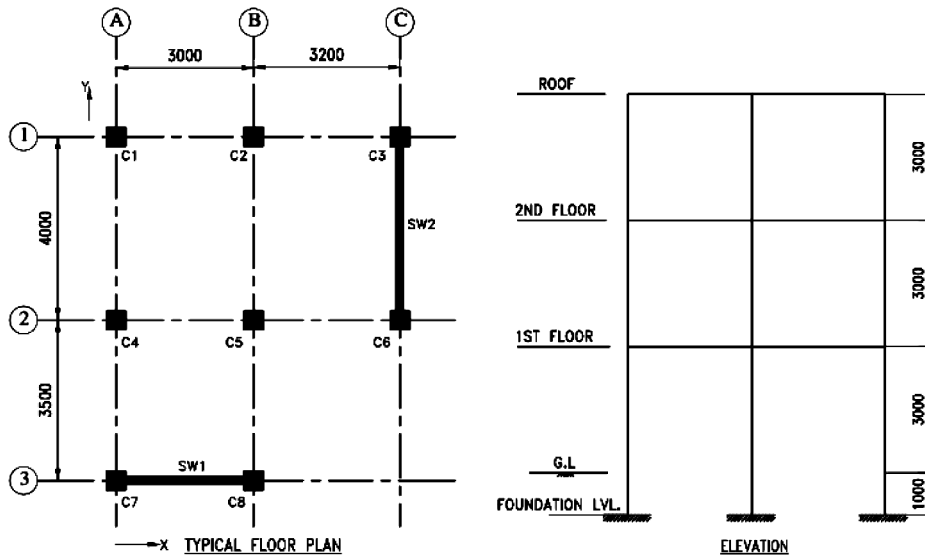
SUBJECT – Analysis and Design of Tall Structures

Part - II

40 marks for this part

**Answer any one question**

1. Calculate the along dynamic wind design peak base bending moment for wind blowing along positive X and Y – directions. Take time periods from code stipulated approximate formulae as per Clause – 9.1 , Note – b of IS 875 (Part - 3) -2015. 40



All column sections are 375 mm X 375 mm, shear walls are 150 mm thick. Assume suitable values of other data, if required. Assume M35 concrete and Fe500 steel.

OR

2. Design and detail a concrete shear wall 4200 mm X 180 mm as per IS 13920 with the following data :

40

Factored axial load = 3200 kN , factored shear force = 480 kN, factored bending moment = 2500 kN-m.

Assume M35 concrete and Fe500 steel.