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

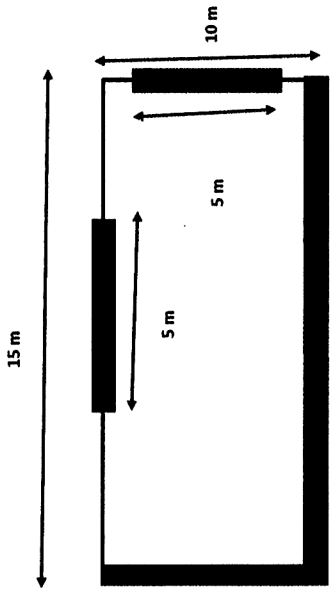
Analysis and Design of Tall Structures (SE)

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 (4X15=60)
1 (CO-1)	Consider a two storied building having mass at the first floor 80 Ton and ground floor 60 Ton. Stiffness of ground floor and 1st floor are 20 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)	Define different type of seismic analysis carried out for a structure. What is Pushover analysis? Explain the step by step procedure of push over analysis according to ATC 40 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 compression member and describe the possible reasons.	13
4 (CO-3)	Explain with figure different type of tall structure with schematic diagram. Briefly describe about their lateral load resistance capacity.	13
5 (CO-3)	 Consider the shear wall system of height 5m and 4m upto roof and 1m from parapet having thickness of wall 175mm. Determine the torsional moment considering design and accidental eccentricity if it is situated in zone IV and roof weights are 5kN/m^2.	13

Ref. No. : Ex/PG/CE/T/127A/2025

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

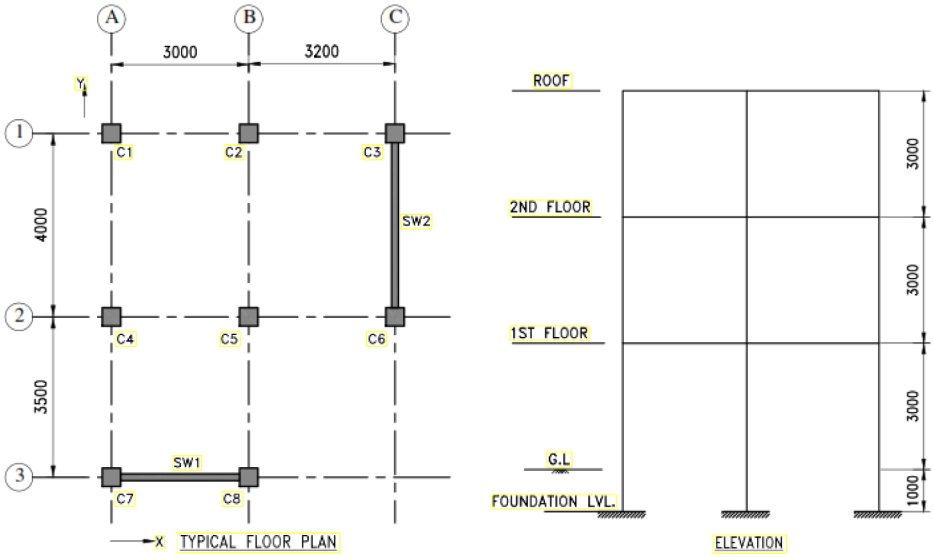
SUBJECT – Analysis and Design of Tall Structures (SE)

Part - II

40 marks for this part

Answer any one question

1. Calculate the along and across dynamic wind design peak base bending moment for wind blowing along positive Y – direction. 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 400 mm X 400 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 4500 mm X 150 mm as per IS 13920 with the following data : 40

Factored axial load = 2800 kN , factored shear force = 450 kN, factored bending moment = 2800 kN-m.
Assume M40 concrete and Fe500 steel.