B. CONS. ENGG. 3RD YEAR 2nd SEMESTER EXAM. 2024

DESIGN OF STRUCTURE – III

Time : Three hours   Full Marks : 100

(50 Marks for each Part)

Part - I (Full Marks: 50)

Use **Separate Answer Script** for Each Part

Answer any **Two Question.**

Assume suitable data not provided. Use relevant design codes

A **multi-storied RCC residential building** to be constructed at **Siliguri** at terrain category II. The plan & elevation are shown in Fig – 1. The thicknesses of outer & inner walls are 200 mm & 100 mm respectively. Live load = 3 kN/ m^2, Slab thickness = 100 mm, floor finish = 30 mm, ceiling plaster = 10 mm.
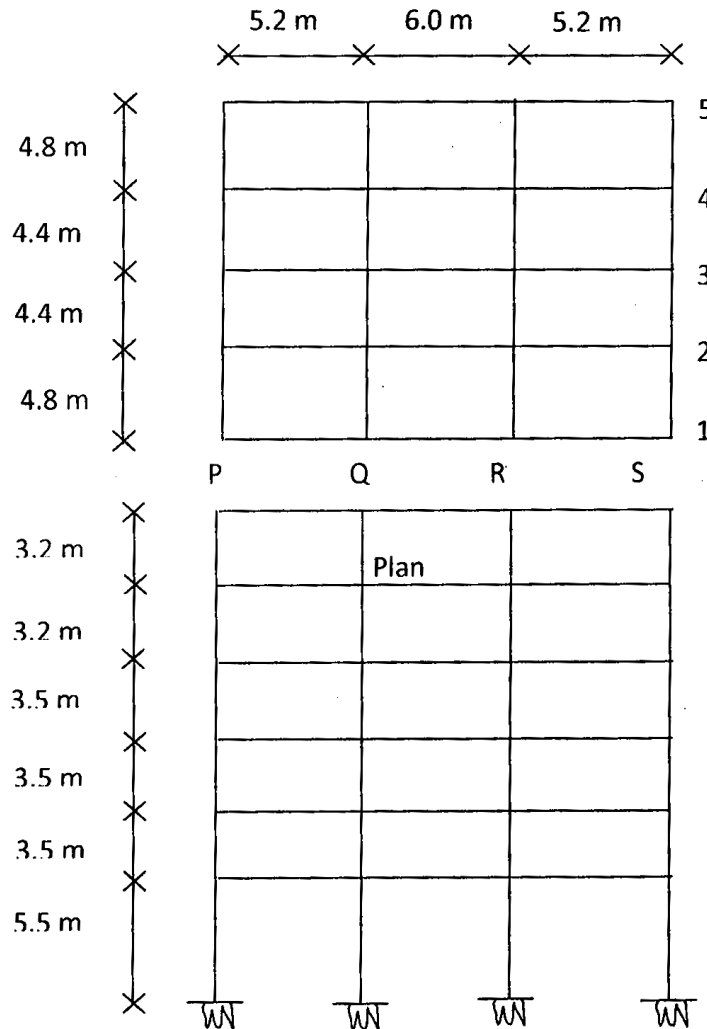

Fig. 1: (Elevation)

Calculate the **design span moments** due to **Dead + Live** load of the frame at 2nd Floor level of the frame **3/P-Q-R-S**. Draw neat sketch and detail calculations.   **25**
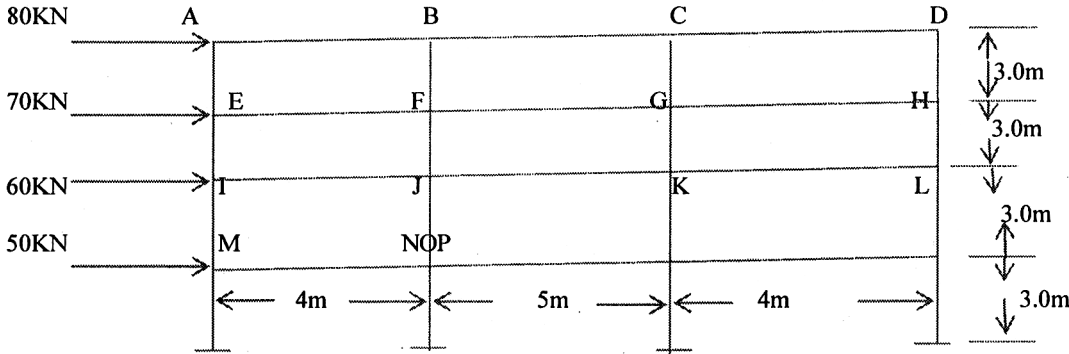
2 a) Discuss **Equivalent Static Method** for Seismic Design of Buildings   **5**

b) Calculate the **design forces due to seismic load at each floor** and the maximum bending moment & axial force in columns & bending moment in beams at 1st floor level of the frame PQRS/3 as stated in problem 1 & Fig.1 by Portal method.   **20**

3 a) How do you calculate the **design wind pressure** and design wind load on a regular building as per **IS 875, Part 3**.   **5**

b) Calculate the design forces due to wind load as per IS: 875 at all floor level of the frame **Q/1-2-3-4-5** of the multi-storied building as stated in problem 1 & Fig.1. Evaluate the bending moment, Shear force and axial forces in beams & columns of the frame **Q/1-2-3-4-5 at 2nd floor** level by Portal method.

     20

B. Construction Engineering 3rd year2[nd] SemesterExamination – 2024
Subject: Design of structure-III

Total Time:3hour
Full Marks: 100

PART-II(Full Marks-50)

CO2 [20]	[1]Analyses the frame by portal method. Assume any other relevant data if required. 80KN A B C D 3.0m 70KN E F G H 3.0m 60KN I J K L 3.0m 50KN M N P ←— 4m —→←— 5m —→←— 4m —→ 3.0m
CO4 [20]	[2]Answer all questions in this block.[15+5=20] a.) Design a simple shear wall of length 6m and thickness 200mm. uses M25 Grade concrete &Fe-500 Grade Steel. Use the following data and assume any other data if required.[15] | SL.No.	Loading	Axial Force (KN)	Moment (KNM)	Sear (KN)
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1	DL+LL	1200	500	250
2	EL	300	3000	500	 b.) Write the name of different type of shear wall along with sketch. [5]
CO5 [10]	[3]What do you mean by Machine foundation? Write the different type of Machine foundation along with sketches. [10]

The students of the course should be able to
CO1: Analysis & Design Tall Structure, Wind & Earthquake Forces, (K4)
CO2: Demonstrate Portal & Kani's Method (K2)
CO3: Application in Earthquake Resistant Design & Response Spectrum Method (K3)
CO4: Analysis & Design &Shear Wall in Tall Structures, (K4)
CO5: Describe Machine Foundation, Industrial Structure, Form Work Design (K1)