B. CONS. ENGG. 3RD YEAR 2nd SEMESTER EXAM. 2022

DESIGN OF STRUCTURE – III

Part - I (Full Marks: 50)

Use **Separate Answer Script** for Each Part

Answer Question No. 1 and any **One Question.**
Assume suitable data not provided. Use relevant design codes

A multi-storeyed **RCC residential building** will be constructed at **Guwahati.**
The **Plan & Elevation** and other details are shown below.
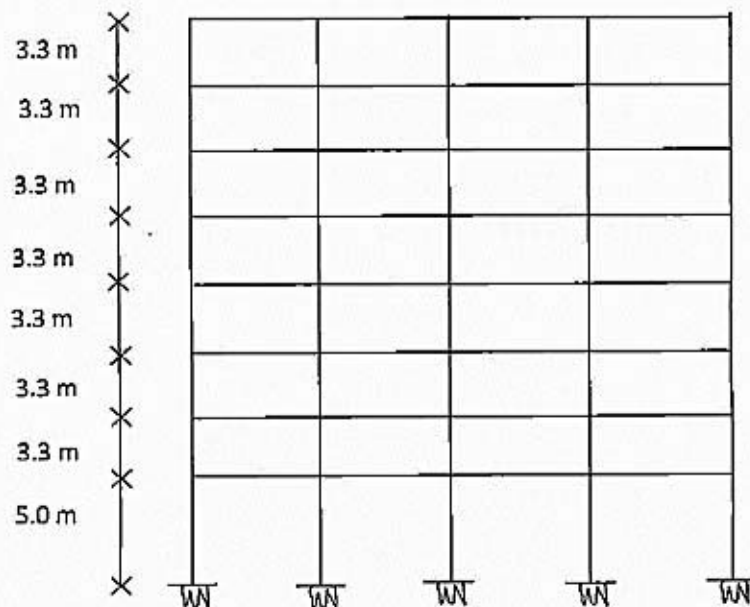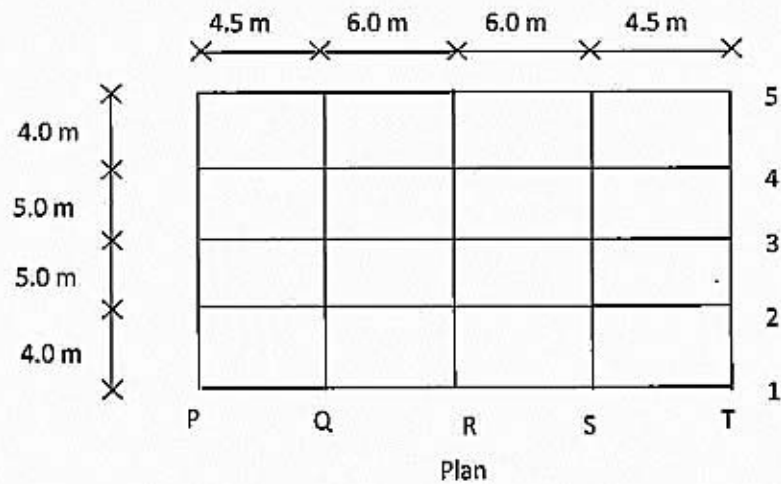

Plan

Fig. 1: (Elevation)

The thicknesses of outer & inner walls are 250 mm & 125 mm respectively. Design Live load = 2 kN/m^2, Slab thickness = 120 mm, floor finish = 30 mm, Plaster = 10 mm (ceiling) & 25 mm (wall). Columns sizes are 400 mm X 400 mm and the size of all beams is 250 mm X 400 mm. The grade of concrete is M30.

1. What are the design (**Dead + Live**) **Load** on the frame 3/P-Q-R-S at 3th **Floor** level as shown in Fig 1. Calculate the Support Moments of the said frame by Moment Distribution Method   **25**

2. a) Discuss **Equivalent Static Method** for seismic design of structure as per the relevant clauses of IS: 1893 Part-1, 2016   **10**

   b) Draw the Bending Moment and Shear force Diagram of the Beam 3/P-Q-R-S at 3rd Floor level in continuation of the **Problem 1**.   **15**

OR

3. Calculate the **design forces due to seismic load at each floor level** of the frame 3/P-Q-R-S of Fig. 1.   **25**

Ref. No. **Ex/CON/PC/B/T/323/2022**
B.E Construction Engineering 3rd year 2nd semester Examination – 2022
Subject: Design of Structure-III
Full Marks: 50(Part-II)
Use separate answer sheet for each part.

[1] Analyses the frame by portal method.[20]
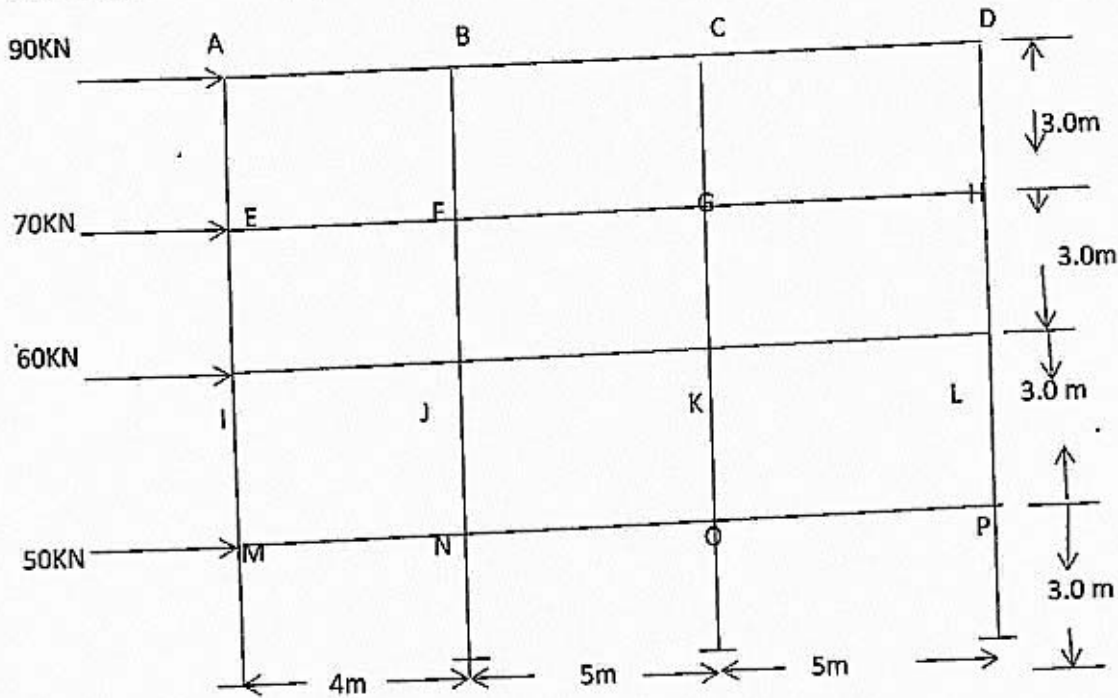
[2] Assuming LL on IJ=10KN/m, JK=KL=20 Kn/m. Assume any other relevant value if required. Find out the maximum Positive BM at Span JK and also draw the BMD. Use method of Substitute Frame.[20]

Answer Question No. 3 or 4

[3] Design a simple shear wall of length 8m and thickness 300mm. uses M25 Grade concrete &Fe-500 Grade Steel. Use the following data. Assume any other data if required. Use IS13920:2016   [10]

SL.No.	Loading	Axial Force(KN)	Moment (KNM)	Sear (KN).
1	DL+LL	1500	550	300
2	EL	350	4000	600

[4] Answer any two

a. Write the name of different type of shear wall along with sketch. [5×2=10]

b. What do you mean by Machine foundation? Write the different type of Machine foundation along with sketch.

c. Write the name of different type of Truss along with sketch.