

**B. CONS. ENGG. 4<sup>TH</sup> YEAR 1<sup>ST</sup> SEM EXAM.-2019**

**DESIGN OF STRUCTURE – III**

**Time: Three hours Full Marks: 100**

**Use Separate answer – script for each Part**

**Part - I**

Answer any **two** questions. Assume suitable data not provided. Use relevant design codes

A multi-storeyed **RCC residential building** will be constructed at **Guwahati** at terrain category II. The plan & elevation are shown below.

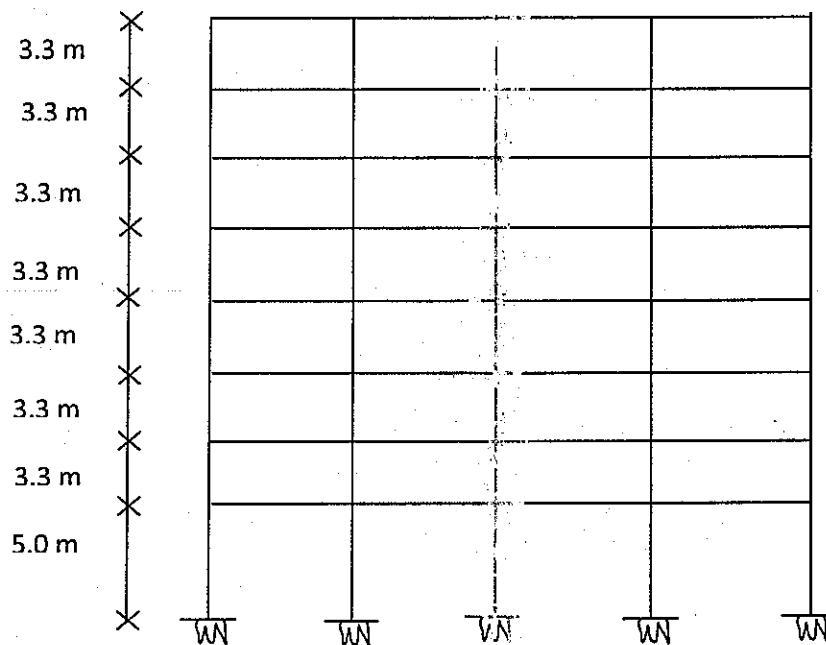
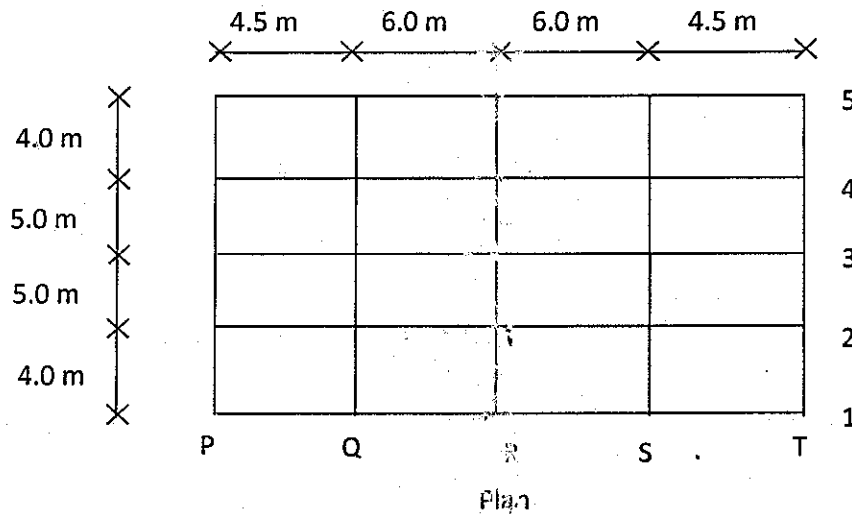


Fig. 1: (Elevation)

The thicknesses of outer & inner walls are 250 mm & 125 mm respectively. Design Live load =  $2 \text{ kN/m}^2$ , 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. a) What are the basic safety objectives in seismic design consideration? Discuss **Response Spectrum** method for seismic design of structure? **5**  
b) Calculate the design forces due to seismic load at each floor level of the frame **3/P-Q-R-S** of Fig. 1. Evaluate the maximum bending moment in columns & beams of the frame **3/P-Q-R-S** at **3<sup>rd</sup>** floor level, by Portal method. **20**
2. Calculate and draw the **Design (Dead + Live) Moment** of the frame **3/P-Q-R-S** at **4<sup>th</sup>** Floor level as shown in Fig 1. **25**
3. a) Write down the **basic assumption and discuss the Portal method.** **5**  
b) Calculate the design forces due to wind load as per IS: 875 at all floor level of the frame of the multi-storied building as shown in Fig.1. Evaluate the bending moment, Shear force & Axial forces in columns of the frame **3/P-Q-R-S** at **5<sup>th</sup>** Floor level by Portal method. **20**

B. Construction Engineering 3<sup>rd</sup> year 1<sup>st</sup> Semester Examination – 2019  
Subject: Design of structure-III

Total Time: 3 hour

Full Marks: 50

PART-II(Full Marks-50)

Use separate answer sheet for each part.

Answer all the Question

<p>CO2 [20]</p>	<p>[1] Analyses the frame by portal method.</p>
<p>CO4 [10]</p>	<p>[2] Write the name of different type of shear wall along with sketch. Write the step of design of shear wall as per IS 13920 : 2016</p>
<p>CO5 [20]</p>	<p>[3] (a) Write a Short Note Machine foundation? Write the different type of Machine foundation along with sketch. [5=5=10.] (b) Draw the different type of Roof truss.[5] (c) Write the different steps/parameters for formwork design. [5]</p>

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)