Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH (CIVIL) END SEMESTER EXAMINATIONS

DECEMBER 2020

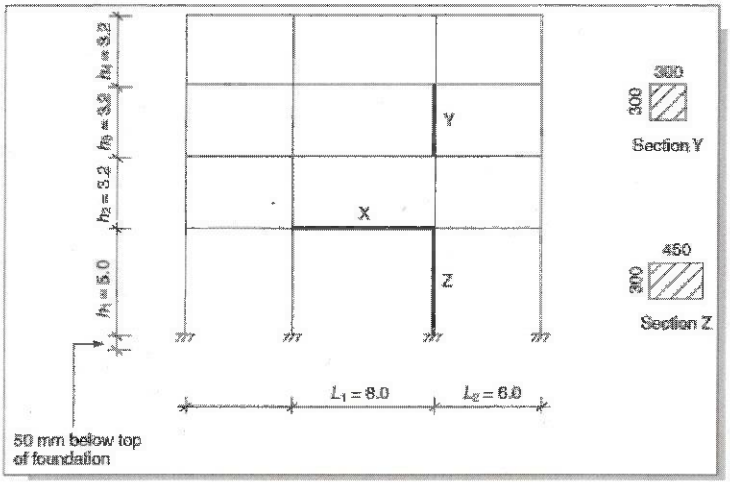
SUBJECT: PROGRAMME ELECTIVE V- Precast Technology

[CIE 4002]

Date of Exam: 30/12/20 Time of Exam: 9AM – 12PM Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitably assumed
- Use of IS-456 is allowed

1A.	How does the shrinkage of concrete influence the stability of joints in precast structures?	**(04)**
1B.	Explain the load Transfer mechanism in braced and unbraced precast frames with neat figures.	**(06)**
2A.	Using sub structuring techniques determine, the bending moments in the beam X and columns Y and Z identified in Figure. The beam–column connections are pinned and the foundation is rigid. The distance from the edge of the column to the center of the beam end reaction is 100 mm. Characteristic beam loading is $g_k = 37$ kN/m and $q_k = 28$ kN/m. Adopt the partial safety factor of 1.5 for Dead load and live load. 	**(08)**
2B.	Differentiate Connections and Joints	**(02)**
3A	Explain the mechanism of lateral load distribution in hollow core units.	**(05)**
3B.	Explain the distribution of horizontal loading in a shear wall	**(05)**
4A	A column 18.5 m long and 300mmx400mm in cross section is to be lifted from moulds. Suggest optimum lifting strategies to be adopted also calculate the flexural Lifting requirements. On site the column is erected in vertical position using 4 props inclined at 60°, one per face, connected to the column at height 3.2m above the foundation. This is an edge column which supports the beam connected to 400mm wide face. Beam carries load of 47.5 m^2 slab, resulting temporary construction load of 120kN per floor..	**(10)**

	Take e as 75mm. height to soffit of 1st floor and 2nd floor beams is 4.2m and 7.7m respectively. Characteristic wind pressure is 0.8kN/m^2. Use safety factor of 1.5. Determine maximum ultimate overturning moment, ultimate horizontal reaction and propping reaction assuming that 1st floor is not fully connected until 2nd floor is completed. f'_{cu}=15N/mm^2, f_{cu}=55 N/mm^2, f_y=500 N/mm^2, cover to 8mm dia links = 30mm	
5A.	Describe the load transfer at joints with the help of stress contours.	**(05)**
5B.	What is a moment resisting connection? What is its significance in precast structures. What are its applications.?	**(05)**