

Roll No.

24378

**B. Tech 6th Semester (Civil)
Examination – May, 2018**

DESIGN OF CONCRETE STRUCTURES - II

Paper : CE-302-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is *compulsory*. Each question carry equal marks. Students have to attempt *five* questions in total at least *one* question from each Section. Use of IS 456-2000 & IS; 1343 is allowed. Assume suitable data if missing.

1. Write short note on the following : 5 × 4 = 20

- (i) What are the limitations in direct design method of flat slab ?
- (ii) What are the requirements for an impervious water tank ?

- (iii) State the assumption of yield line theory.
- (iv) What are the factors to be considered while choosing a foundation system ?
- (v) When a mat foundation is resorted to structure ?

SECTION – A

2. A semi circular beam is simply supported on three equally spaced columns. Show that the maximum bending moment and the twisting moment are equal to $0.429wR^2$ and $0.1045w R^2$ respectively. 20

OR

Design RC rectangular three span continuous beam with each span = 5m, carrying a slab 110 mm thick over it (slab not cast monolithically). The live load over the slab may be taken as 2000 N/m^2 and finishes as 1500 N/m^2 . The width of slab which transfers the load to beam may be taken as 4.5m. Use M 25 concrete and Fe 415 steel.

3. Design the stair for a public building, supported on wall on both side. The horizontal span of stair is 1.5m. The risers are 120 mm and tread are 300 mm. Use M20 mix. <http://haryanapapers.com> 20

OR

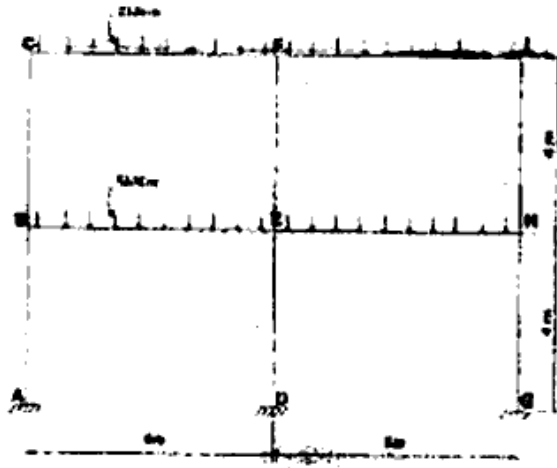
Design the interior panel of a flat slab 7x 7 m in size, supported by column of size 600mm × 600mm for a super imposed load of 5.5 KN/m^2 . Provide two way reinforcements. Use M25 concrete and Fe 415 reinforcement.

SECTION - B

4. Design Square footing for two columns A and B, carrying loads of 800 kN each. Column A and column B is of 300mm in diameter. The centre to centre spacing of the column is 4m. The safe bearing capacity of soil is 200 kN/m^2 . Use M 20 mix. $\sigma_{st} 140 \text{ N/mm}^2$. 20.
5. Design an cylindrical tank for a capacity of 3,00,000 liters. The bearing capacity of soil is 20000 N/m^2 . Use M25 concrete and Fe 415 steel. 20

SECTION - C

6. (a) What are the various prestressing system ? What are the different type losses to be considered for the pre-stress ? 15
- (b) Explain Mangal's method. 5
7. Analyze the building frame using approximate method :. 20



SECTION - D

8. (a) A rectangular slab $4 \times 6 \text{ m}$ in size, fixed at the edges. The slab is expected to carry a service load of 5 kN/m^2 and a floor finishing load of 1.5 kN/m^2 . Use M 20 concrete and Fe 415 steel. Design the slab if (a) it is isotropically r/f (b) if is orthoisotropically r/f with $\mu = 0.6$. 15
- (b) State the upper and lower bound theorems. 5
9. (a) Consider a rectangular slab of size $8\text{m} \times 6\text{m}$ with one of its longer side free and the other three side simply supported. The reinforcement in two perpendicular direction are such that $m_x = 12 \text{ kN/m}$ and $m_y = 15 \text{ kN/m}$. Find its collapse load. 15
- (b) What are the characteristics features of yield line ? 5

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