SECTION – D

8. (a) A rectangular slab 4 x 6 m in size, fixed at the edges. The slab is expected to carry a service load of 5 kN/m² and a floor finishing load of 1.5 kN/m². Use M 20 concrete and Fe 415 steel. Design the slab if (a) it is isotrophically r/f (b) if is orthoisotrophically r/f with μ= 0.6.   15

   (b) State the upper and lower bound therems.   5

9. (a) Consider a rectangular slab of size 8mX6m 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= 12kN/m and m_y 15kN/m. Find its collapse load.   15

   (b) What are the characteristics features of yield line ?   5

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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 x 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 if 1.5m. The risers are 120 mm and tread are 300 mm. Use M20 mix.   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.

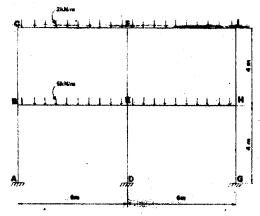## SECTION – B

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 soli is 200'kN/m^2. Use M 20 mix. σ_{st} 140N/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^3. 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