own in fig.9.]

Register Number.....

M.E. DEGREE EXAMINATIONS: DECEMBER 2009

First Semester

STRUCTURAL ENGINEERING

SEE503: Advanced Reinforced Concrete Structures

Time: Three Hours **Maximum Marks: 100**

Answer All the Questions:-

PART A (10 x 2 = 20 Marks)

1. How to calculate the deflection due to shrinkage as per IS 456: 2000?
2. List out the methods of estimating the crack width in beams.
3. List out the various cases of loading for two-span continuous beam for drawing elastic BMD as per IS 456:2000.
4. Write down the advantages and disadvantages of moment redistribution.
5. What are the two considerations for the minimum thickness of deep beam?
6. What are the allowable bending stresses in deep beam as per BS 8110?

(6) 7. What is "gust effect"?

ain the syst 8. What are the approaches to determine the effect of wind on structures?

and the for 9. What are the conclusion arrived by American society of civil engineers in 1940 for analyse the frame under horizontal load ?

(10

10. What are the four basic vertical loading system identified for tall building?

PART B (5 x 16 = 80 Marks)

11. (a) Check the deflection requirement for the "T" beam continuous over 12m span. Flange width = 1200 mm , web width = 250 mm , effective depth 400 mm , area of tension steel = 1260 mm^2 , area of compression steel = 402 mm^2. Assume that:

(i) Fe 415 grade steel

(ii) Fe 250 grade steel are used in construction.

(OR)

(b) A beam of width 450 mm, depth 750 mm, cover of reinforcement 40 mm is reinforced with 3 rods of 40 mm (3780 mm^2) diameter. Calculate the crack width when the section is subjected to a bending moment of 490 kNm at the following points (i) at a point on the side of the beam 250 mm below the neutral axis (ii) at a point midway between bars at the tension face (iii) at the bottom corner (iv) at the tension face directly under the bar. Assume f_{ck} = 25 N/mm^2 and f_y = 415 N/mm^2.Use the method recommended by IS 456 and BS 8110.

12. (a) A tee beam ABC is continuous over two span of 8 m each and it carries uniformly factored of 75 kN/m. Assuming f_{ck} = 25 N/mm^2 and f_y = 415 N/mm^2 (with bilinear stress strain cu check whether we can reduce the maximum moment by 30 % and redistribute to the s Width of flange 1000 mm, width of web = 300 mm. Thickness of slab = 150 mm. D = 820 d = 770 mm are given.

(OR)

(b) (i) Discuss about redistribution of moments in a fixed beam (8

(ii) Discuss about the conditions for moment redistribution (8

13. (a) Design a simply supported deep beam of length 5.25 m loaded from two columns at 1.75 m f each end with 3750 kN. The total depth of the beam is 4.2 m and the width of supports is mm. Assume 40 grade concrete and Fe 415 grade steel.

(OR)

(b) Design a waffle slab 3.6 x 3.9 m continuous over two adjacent sides and simply supported on other two sides if it is made of pre cast funicular shells so that ribs are spaced at 1.2 m x 1.2 Assume factored UDL = 10 kN/m , f_{ck} = 25N/mm^2 and f_y = 415 N/mm^2

14. (a) Discuss about the general theory of wind effects of structures.

(OR)

(b) Discuss about the design wind speed based on Indian code.

15. (a) Discuss about Portal method of analysis of frames under horizontal loads.

(OR)

(b) Discuss about the effect of lateral load on frames and compare the results of analysis based on various methods.

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