

beam = 6 cm, Width of support = 0.6 cm, Width of beam = 0.4 cm, Total load on beam including self weight = 400 kN/m, Concrete = M20 Grade Steel = Fe415 HYSD bars. 20

SECTION – D

8. A flat plate with 7.5 m × 7.5 m panels on 500 mm × 500 mm columns has a slab thickness of 180 mm, designed for a total load of 8.0 kN/m². Check the safety of slab in shear and find the stirrups for reinforcing in the slab. Use M20 and Fe415. 20

9. Design the interior panel of a flat slab with drops for an office floor to suit the following data : Size of office floor = 25 m × 25 m, Size of panels = 5 m × 5 m, Loading class = 4 kN/m², Materials : M20 grade concrete Fe415 steel. 20

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(4)

Roll No.

23722

M.Tech. 1st Sem. (Civil Engg.) (Computer Aided Structural Engg.) CBCS Scheme Examination – January, 2023

COMPUTER AIDED REINFORCED CONCRETE DESIGN

Paper : 21MTCASE2C2

Time : Three hours]

[Maximum Marks : 100

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

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*.

All questions carry equal marks.

1. (a) What is anchorage bond in Concrete ? Write the formula to express it. 2.5 × 8 = 20
(b) What do you mean by development length in reinforced concrete ?
(c) On what quantities crack width of flexural crack depends ?
(d) Why ductile detailing of RCC frames done ?
(e) What are different types of beam column joints ?

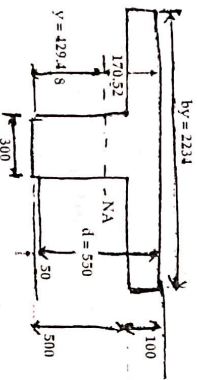
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- (f) What is the thickness of flat slab with drops and without drops ?
- (g) Distinguish between one way shear and punching shear in flat slabs.
- (h) What are applications of shear walls ?

SECTION – A

2. The cross section and tensile steel of simply supported T Beam of 8 m span using M20 and Fe415 subjected to dead load of 9.3 kN/m and imposed load of 10.7 kN/m at service. Calculate short term and long term deflections and check requirements of IS 456. 20



3. (a) State stipulation of IS 456 regarding the control of deflection. 10
- (b) How would you select preliminary dimensions of structures to satisfy (i) deflection requirements (ii) the lateral stability. 10

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SECTION – B

4. A six storey bay building is to be located at Vishakhapatnam. Determine lateral forces and storey shears on an inner frame due to wind loads (IS 875 - 1987(Part-3) and Earthquake loads (IS 1893-1984) using the following data : Bay width = 6.5 m c/c, frame spacing = 5 m c/c, height of ground floor = 4 m, height of other floors = 3.5 m, floor thickness = 15 cm, floor finish = 4 cm, Outer columns = 30 cm × 50 cm, Inner columns = 30 cm × 60 cm, Girders below floor slab = 30 cm × 35 cm, Live load = 5 kN/m². 20

5. (a) Explain in detail ductile detailing of RCC Frames. 10
- (b) Step by step explain design of building frames for earthquake loads. 10

SECTION – C

6. (a) Explain minimum reinforcement requirement in shear walls as per IS 456 Code. 10
- (b) Explain the design procedure to design the shear wall. 10

7. Design a single span deep beam to suit the following data and draw reinforcement details in deep beam. Effective span of the beam = 6 m, Overall depth of the

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