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**23379**

**M. Tech. 1st Sem. (Civil Engg.) (Elective-I)  
Examination – January, 2023**

**ADVANCED REINFORCED CONCRETE DESIGN**

Paper : CE-614

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 :** Attempt any *five* questions. All questions carry equal marks.

1. (a) What are the different options available to a designer with regard to control of cracking in flexural member ?  
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- (b) A beam of width 400 mm, depth 650 mm cover of reinforcement 40 mm is reinforced with 3 rods of 50 mm diameter. Determine the crack width when the section is subjected to a BM of 490 kNm at a point on the side of the beam 300 mm below the neutral axis.  
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2. A six story 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 = 7.5 m c/c, frame spacing = 5 cm c/c, height of ground floor- 4m, height of other floors = 3.8 m, floor thickness = 10 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/m<sup>2</sup>.

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3. Explain short term and long term deflection and respective influencing factors of them.

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4. (a) Discuss in detail the main factors considered in design of beam column joint.

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(b) What is cranking of reinforcement in a joint bad detailing ? Explain with sketch.

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5. Step by step explain design of building frames for wind loads.

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6. Explain in brief :

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(a) Applications of shear walls

(b) Ductile detailing of RCC Frames

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7. The reinforced concrete beam girder is continuous over spans of 8 m apart from c/c. It is 4.4 m deep and 330 mm thick and supports of column 900 mm width. If the girder supports a UDL of 210 kN/m inclusive its own weight. Design Deep beam using M20 Grade concrete and Fe415 Grade steel.

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8. Design a shear wall of length 5.0 m and thickness 250 mm subjected to the forces given below and the wall is a high wall with the following loadings. Use M25 and Fe415 :

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S.No.	Loading	Axial Load (KN)	Shear Force (KN)	Bending Moment (KN-m)
1	DL+LL	1950	500	20
2	Seismic load	200	4500	80

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