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Total Number of Pages : 02

M.TECH

M.TECH 2ND SEMESTER REGULAR EXAMINATIONS, MAY 2018

ADVANCED REINFORCED CONCRETE DESIGN

Branch: SE, Subject Code:MSEPC2010

Time: 3 Hours

Max Marks : 70

PART-A**(10 X 2=20 MARKS)****1. Answer the following questions.**

- a) What is the difference between limit state of collapse and limit state of serviceability? CO4
- b) What do you mean by a slender column? CO4
- c) What are the various factors that effects deflection? CO4
- d) What do you mean by counter fort retaining wall? CO3
- e) What is the purpose of taking minimum eccentricities in column design? CO4
- f) State the assumptions in yield line theory. CO2
- g) Showing the curtailment and also bent up bars, draw the reinforcement detailing of a continuous beam. CO1
- h) Draw figures showing different modes of shear cracking in RCC beams. CO4
- i) Why the short span is considered for bending moment calculations in two way slabs? CO2
- j) What is 'shear span'? CO3

PART-B**(5 X 10=50 MARKS)****Answer any five questions from the following.**

2. a. Design a simply supported isotropically reinforced square slab of side 3.0m to carry a service load 5.6 kN/m^2 . Use yield line theory, M_{15} concrete and Fe_{500} steel. CO2 (5)
- b. Draw reinforcement details as per codal requirements. CO2 (5)
- 3.a. By yield line theory design simply supported two way slabs with unrestrained corners and clear spans of 3.5 m and 5.5 m subjected to live load of 8 kN/sqm . Take Fe_{500} steel and severe exposure condition. CO2 (5)
- b. By yield line theory design a square slab of 6.8 m clear span with unrestrained corners and fixed boundary subjected to live load of 5.5 kN/sqm . Take Fe_{500} steel and moderate exposure condition. CO2 (5)

4. a. Calculate the maximum probable crack width for the one-way slab of clear span 4.5 m, simply supported on 230 mm thick masonry walls, subjected to a live load of 4 kN/sqm and surface finish of 1 kN/sqm by IS method with the following data: CO2 (5)
 D =200 mm
 Steel provided 10 mm dia @ 150 mm c/c
 Fe 415 steel , fck= 25 MPa
 Moderate exposure condition.
- b. explain clearly the difference in behavior of one way and two way slabs. CO2 (5)
5. a. A simply supported beam is of effective span 6.0 m. whose depth is limited to 450mm. the live load on the beam is 40 kN/m. there is one concentrated load of 20 kN at mid span. Design the flexural reinforcements taking M₃₀ concrete and Fe₅₀₀ steel with mild exposure conditions.CO3 (5)
 b. Perform check as usual for the above beam. CO1 (5)
6. a.A simply supported beam is of effective span 6.0 m. whose depth is limited to 450mm. The live load on the beam is 40 KN/m. There are two concentrated loads of 25KN at one third span points from both ends of the beam. Design the shear reinforcement of the beam assuming Fe415 steel for shear reinforcement. Provide adequate curtailment of bars. CO1 (5)
 b.Apply necessary checks for the above shear design CO1 (5)
7. a. Explain bar bending schedule. CO1 (5)
 b.State some advantages of limit state method. CO4 (5)
8. Write short notes on: (5x2)
 a. Plastic hinge CO4
 b. Compatibility Torsion CO1

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