

Code.No: R05310102

R05

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
BASIC REINFORCED CONCRETE DESIGN & DRAWING
(CIVIL ENGINEERING)

Time: 3hours**Max.Marks:80**

Answer any ONE questions from PART-A
Answer any THREE questions from PART-B

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PART-A

1. Design an L beam for an office floor given the following data:
 Clear span: 6m
 Thickness of flange = 150mm
 Service load: 4kN/m^2
 Spacing of beam : 3m
 $f_{ck} = 25\text{N/mm}^2$, $f_y = 415\text{N/mm}^2$
 L beams are monolithic with columns. Width of column = 300mm. Sketch the reinforcement details.
2. A rectangular column 300 x 450mm is subjected to an axial load of 1800kN at service conditions. Design the column and a suitable rectangular footing of uniform depth. Assume moderate exposure condition. $f_{ck} = 25\text{N/mm}^2$ and $f_y = 415\text{N/mm}^2$. SBC of soil is 200kN/m^2 . Sketch reinforcement details. Adopt limit state method.

PART-B

- 3.a) Distinguish between One-way and Two-way slabs with sketches.
 b) Design a reinforced concrete slab of size 5m x 4m. All the four edges are discontinuous and corners are held down. The slab has to carry a live load of 3kN/m^2 . And floor finish 1kN/m^2 . Use M20 concrete and Fe 500 steel.
- 4.a) List out the factors influencing the short term deflection, long term deflection of RC beams.
 b) A rectangular simply supported beam of span 5m is 300mm x 500mm in cross section. It carries a live load of 10kN/m and a dead load of 5kN/m . (including self weight). It is reinforced with 4 bars of 25mm diameter on the tension side at an effective cover of 50mm. Calculate the short term deflection at mid span. Use M25 concrete and Fe-415 steel.
5. Design a column of unsupported length 3m to carry an axial load of 2000 kN and a BM of 150kNm at service conditions. Design the column as a short column. The column is subjected to severe exposure condition and grade of steel is Fe500. Provide equal reinforcement on all the faces. Use M30 concrete. Sketch reinforcement details.

6. A rectangular beam 230mm wide is subjected to the following at a section
1. Sagging bending moment of 25kNm.
 2. Shear force of 20kN.
 3. Torsional moment of 30kNm.
- Use M25 and Fe-415 steel. Design a suitable section and find the reinforcement required in the section.
- 7.a) What is meant by 'T' beam? How the effective width of a flange of a 'T' beam is determined.
- b) A Rectangular RC beam is of 230mm × 550mm, overall size, with an effective covers of 50mm on both the tension and compression sides. It is reinforced with 4 bars of 16mm diameter bars on compression side. Calculate the steel on the tension side and Ultimate moment of resistance of section. Use M25 concrete and Fe 500 steel.

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