

(DCE 314)

B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Third Year)

CIVIL ENGINEERING

Paper - IV : Design of Concrete Structures - I

Time : 3 Hours

Maximum Marks : 75

Answer ONE question from each unit

All questions carry equal marks

UNIT - I

- 1) An isolated T-beam of span 4.5m has a 800mm wide flange 100 mm thick. The overall depth of the beam is 450 mm and the width of the rib is 250 mm. The beam is reinforced with 4 bars of 20 mm diameter. If the permissible stresses in concrete and steel are 7 N/mm^2 and 230 N/mm^2 , find moment of resistance. Take $m = 13.33$ use working stress method.

OR

- 2) a) What are the assumptions made in a Working stress Design?
b) What are the differences between Balanced section, under Reinforced section & over Reinforced section? Explain.

UNIT - II

- 3) A doubly reinforced beam section is 250mm wide and 500 mm deep to the centre of tensile reinforcement. It is reinforced with 2 bars of 16 mm diameter as compressive reinforcement at an effective cover of 50 mm and 4 bars of 20 mm diameter as tensile steel. Find moment of resistance of the beam section. Use M_{20} concrete and Fe_{415} steel. Use limit state method.

OR

- 4) A T-beam of flange width 1200mm, flange thickness 100mm, rib width 275 mm has an effective depth of 550 mm and is reinforced with 6 bars of 20 mm diameter and 4 bars of 16mm diameter. Find ultimate moment of resistance. Use M_{20} concrete and Fe_{415} steel. Use limit state method.

UNIT - III

- 5) a) Briefly explain the reasons for the development of diagonal tension cracks in R.C beams.
b) Explain the various types of shear failures and shear design of R.C.C. beams.

OR

- 6) A reinforced concrete beam has a support section with a width of 250 mm and effective depth of 500 mm. The support section is reinforced with 3 bars of 20 mm diameter on the tension side. 8mm diameter two legged stirrups are provided at a spacing of 200 mm centers. Using M_{20} grade concrete and Fe_{415} steel, estimate the shear strength of the support section.

UNIT - IV

- 7) Design a balanced singly reinforced concrete beam section having an effective depth twice that of the width to support a uniformly distributed total (dead + live) load of 10kN/m over an effective span of 5m. Assume cover to tensile steel as 50 mm. Adopt M_{20} grade concrete and Fe_{415} grade steel. Use working stress method?

OR

- 8) The main stair of an office building has to be located in a stair measuring $3.5m \times 5.5m$. The vertical distance between the floors is 3.75m. Design the stairs. Allow a live load of $2000 N/m^2$. Use M_{20} concrete and Fe_{415} steel. Use working stress method.

UNIT - V

- 9) A beam and slab floor of R.C.C. consists of a continuous slab supported on beams of 6m clear span having 400 mm end bearings. The beams are spaced at 2.75 meters T-beam. Use M_{20} concrete and Fe_{415} steel. Use limit state method.

OR

- 10) Design a cantilever beam with a clear span of 3.0 m which carries a superimposed load of 25 kN/m run. Use M_{20} Mix and Fe_{415} steel by using LSM.

