

Roll No. \_\_\_\_\_

5E3152

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B.Tech V Semester(Main) Examination Dec 2012  
Civil Engg.

5CE 2 Concrete Structures-I

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

**Instructions to Candidates:**

Attempt overall five Questions Selecting one question from each unit. All question carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and sated clearly. units of quantities used/ calculated must be stated clearly.)

1. Nil2. Nil**UNIT-I**

- Q1. (a) Discuss the Major feature of working stress method and limit state method. (5)
- (b) What do you understand by a Balanced section, Over reinforced and under reinforced section. (5)
- (c) A rectangular singly R.C beam with cross-section 300 mm x 600 mm is simply supported over the clear span of 4.25 m with support of 300 mm each. Calculate ultimate moment resistance of the beam. Use M20 and Fe 415 steel grade. (6)

**OR**

- (a) What do you understand by a singly reinforced beam and doubly reinforced beam. State the condition where a doubly reinforced beam is preferred. (6)

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167

(b) Determine the ultimate moment resistance capacity of a doubly reinforced beam with width of beam as 300mm and effective depth 600mm and cover as 40mm both in tension and compression. Reinforcement in compression as 2 nos @ 25mm  $\phi$  and in tension as 5 nos @ 25mm  $\phi$ . Use M20 concrete and Fe 415 steel grade. (10)

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### UNIT-II

Q2. Design a singly reinforced concrete beam supported on two walls of thickness 500mm spaced at a clear distance of 6m. The beam carries a super imposed load of 10kN/m. Use M20 concrete and Fe 415. Apply all checks. (16)

OR

Q2. Design a doubly reinforced beam which rests over a clear span of 5m. The superimposed dead load is 18kN/m and live load is 12kN/m. Bearing at each end is 150mm. The beam has cross-section of 300 x 550mm. Use M15 and Fe 415 grade. Apply all the checks. (16)

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### UNIT-III

Q3. Design a simply supported R.C. slab for a room having inside dimensions as 3m x 8m. The slab carries a lime concrete of 75 mm thickness at its top. The live load on the slab is 2kN/m<sup>2</sup>. Take unit weight of lime concrete as 20kN/m<sup>3</sup>. Use M20 grade of concrete and steel of Fe 415 grade. (16)

Q5 (

OR

Q3. Design a R.C. slab for a room measuring 5m x 6m from inside. The slab carries a live load of 2kN/m<sup>2</sup> and 25mm thick lime concrete having unit weight as 20 kN/m<sup>3</sup>. The slab is simply supported at the four edges, with corners free to lift. Take the width of supporting wall as 350mm. (16)

### UNIT-IV

Q4. Design a circular column to carry an axial load of 1000 kN. Use M20 and Fe 415 grade of steel. Also provide helical reinforcement for the above column. (16)

[Contd...]

**OR**

- Q4. (a) A concrete column of 450mm x 450mm is reinforced with 4 bars of 20mm dia. Determine the ultimate load capacity of column, using M20 concrete and steel Fe 415 grade. (10)
- (b) Give typical Sketch of the following: (6)
- (i) Isolated square footing.
  - (ii) Strap footing
  - (iii) Raft foundation.

**UNIT - V**

- Q5 A footing supports a square column of size 400mm x 400mm with a service load of 900kN. Find out the size of footing, depth of the footing and reinforcement required in it, if the safe bearing capacity of soil is 200 kN/m<sup>2</sup>. Use M20 and Fe 415. Also draw Neat Sketch. (16)

**OR**

- Q5 (a) Describe one way shear and two way shear in a square footing. (4)
- (b) Determine the thickness and size of R.C footing of a column of size 300mm x 500mm. The column carries a load of 1500 kN and safe bearing capacity of soil at the site 175 kN/m<sup>2</sup>. (12)
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