

Hall Ticket Number:

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Code No. : 16101

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (Civil Engg.: CBCS) VI-Semester Main Examinations, May-2019**

**Reinforced Concrete Design-II**

Time: 3 hours

Max. Marks: 70

- Note: i) Answer ALL questions in Part-A  
 ii) Missing data, if any, may suitably assumed  
 iii) Use of IS 456, code for water tanks and bridges are permitted.

| Q. No                             | Stem of the Question  | M  | L | CO | PO |
|-----------------------------------|---|----|---|----|----|
| <b>Part-A (10 × 2 = 20 Marks)</b> |   |    |   |    |    |
| 1.                                | When are combined footings adopted?   | 2  | 1 | 1  | 1  |
| 2.                                | Why is 'Centroid of footing made to coincide with resultant of column loads' in combined footings, generally?   | 2  | 2 | 1  | 2  |
| 3.                                | Explain the design principles of counter fort in a retaining wall.  | 2  | 2 | 2  | 2  |
| 4.                                | Why is the code of design for water tanks different from that of general structures?  | 2  | 2 | 3  | 1  |
| 5.                                | Discuss the structural action of the walls of a rectangular water tank with $l/b < 2$ .   | 2  | 2 | 3  | 2  |
| 6.                                | List the design procedure for a circular water tank with flexible base.   | 2  | 1 | 3  | 3  |
| 7.                                | Compute the impact factor for Class AA wheeled vehicle for a bridge of span 10m.  | 2  | 2 | 4  | 2  |
| 8.                                | Name the method and formula related to analysis of cantilever slab of a 'T'-beam bridge.  | 2  | 1 | 4  | 1  |
| 9.                                | State the conditions under which Courbon's theory gives better results.   | 2  | 1 | 5  | 2  |
| 10.                               | Discuss the bond considerations in combined footings.   | 2  | 2 | 1  | 2  |
| <b>Part-B (50 Marks)</b>          |   |    |   |    |    |
| 11.                               | Design and detail a Combined Footing for two columns, carrying loads of 1200kN and 1500kN, placed 4.5m apart. S.B.C. of soil is 200 kN/sq.m. Use M25 grade concrete and Fe 415 grade steel.   | 15 | 3 | 1  | 3  |
| <i>(or)</i>                       |   |    |   |    |    |
| 12.                               | A cantilever retaining wall is to retain an earthen embankment 4m above the ground level. Its foundation is 1.2m below ground level. The SBC of the soil is 200kN/m <sup>2</sup> . Unit weight of the earth is 18kN/m <sup>3</sup> . Angle of repose is 30°. Coefficient of friction is 0.55. Check the stability and design the stem. Materials are M25 grade concrete and Fe 500 grade steel. | 15 | 4 | 2  | 3  |
| 13.                               | Design a circular water tank resting on the ground and having rigid connection between the wall and base slab. The capacity of the tank is 50,000 litres and the depth of tank is 4m. Adopt approximate method of design. Materials are M30 grade concrete and Fe415 grade steel. Sketch the reinforcement details.   | 15 | 3 | 3  | 3  |
| <i>(or)</i>                       |   |    |   |    |    |
| 14.                               | Design the a rectangular water tank, resting on ground, of size (inside dimensions) 6 m x 4 m and height 4.2 m with a freeboard of 0.2m. Detail the reinforcement. Use M30 and Fe500 grade steel.   | 15 | 3 | 3  | 3  |

Contd... 2

|   |                 |
|---|-----------------|
| <p>15. Design and detail reinforcement for the Deck slab of a culvert over an effective span of 6 m on a National Highway for Class AA tracked vehicle loading. The bridge has a carriage way of 7.5m with 1.5m wide footpaths on either sides. Use M25 grade concrete and Fe415 grade steel.</p> | <p>20 3 5 3</p> |
| <p>(or)</p>   |                 |
| <p>16. Design the interior slab panel 3mx4m of a T-beam bridge for class AA tracked loading. Assume wearing coat of 80mm thick. Show a sketch of reinforcement details. Materials are M20 grade concrete and Fe415 grade steel.</p>   | <p>20 3 5 3</p> |

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

| S. No. | Criteria for questions   | Percentage |
|--------|--|------------|
| 1      | Fundamental knowledge (Level-1 & 2).   | 17         |
| 2      | Knowledge on application and analysis (Level-3 & 4)                              | 83         |
| 3      | *Critical thinking and ability to design (Level-5 & 6)<br>(*wherever applicable) | --         |

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