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B. Tech. (Civil) (Elective-II) 6th Semester (G Scheme)  
Examination, July-2022

**ADVANCED CONCRETE STRUCTURE**  
**Paper-PEC-CEEL-308-G**

Time allowed : 3 hours]      [Maximum marks : 75

**Note : (i) Question No. 1 is compulsory.**

- (ii) Each question carries equal mark (15 marks).
  - (iii) Students have to attempt 5 questions in total, at least one question from each unit.
  - (iv) Use of IS 456-2000 is allowed.
  - (v) Assume suitable data, if missing.
1. Write short note on the following :       $6 \times 2.5 = 15$
- (i) What are the limitations of Direct Design Method ?
  - (ii) Draw the yield line pattern for the following cases :
    - (a) Circular slab with fixed edges
    - (b) Square slab with simply supported ends
    - (iii) Explain Landing slab and waist slab.
    - (iv) What are the basic assumptions for continuous beam ?

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(v) What is the basic concept of liquid retaining structure ?

(vi) Discuss various forces acts on joints.

Unit-I

2. Design a three span continuous beam of span 4m. The beam is subjected to a factored dead load of 12 kN/m and factored live load of 11 kN/m. Use M20 grade concrete and Fe 415 grade steel. 15
3. A 300 mm × 450 mm ring beam curved in plan is supported on four columns located equidistant on a circle of 5m diameter. The diameter of column is 250 mm and factored load intensity on ring beam is 120 kN/m. Design the beam. 15

Unit-II

4. Design the interior panel of a flat slab 6 × 6 m in size, for a super imposed load of 7 kN/m<sup>2</sup>. Provide two way reinforcements. Use M 20 concrete and Fe 415 reinforcement. 15
5. Design a square slab 6m × 6m in size, fixed supported at the edges. The slab is expected to carry a service load of 7 kN/m<sup>2</sup> and a floor finishing load of 1.5 kN/m<sup>2</sup>. Use M 20 concrete and Fe 415 steel. 15

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Unit-III

6. Design an overhead circular tank for a capacity of 4,50,000 litres with a height of 8m from the bottom. The safe bearing capacity of soil is 19 kN/m<sup>2</sup>. Use M25 concrete and Fe 415 steel. Assume suitable data if necessary. 15
7. Design the suitable stair case for a public building in which the vertical distance between floors is 6m. The stair hall measures as 4m × 7m. The live load may be taken as 3000 N/m<sup>2</sup>. Use M20 concrete and HYSD bars. 15

Unit-IV

8. Explain the cantilever method for analyzing a building frame subjected to horizontal forces. 15
9. Design a corbel to support factored load of 500 kN applied at a distance of 140 mm from the column face. The column is 300 mm × 350 mm in plan. Assume M30 concrete Fe 415 steel and moderate environment. 15

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