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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Civil Engineering

Semester End Examination; Dec. - 2014

Advanced Design of RC Structures

Time: 3 hrs

Max. Marks: 100

Note: i) Answer any TWO full questions from each part.

ii) Assume any missing data suitably.

iii) Use of I.S. Codes permitted

PART - A

1. Design a circular tank, with domical top for a capacity of 4,00,000 liters. The depth of water is to be 4 m, including a free board of 300 mm. The tank is supported on masonry. Sketch the details of steel. Adopt M20 concrete and Fe415 steel. 25

2. Design a silo for storing wheat using Airy's theory for following data. 25
 Density of Wheat = 8 kN/m^3
 For wheat $\mu = 0.466$
 For wheat $\mu' = 0.444$
 Diameter of silo = 5 m
 Height of silo = 16 m
 Central opening = 500 mm
 Concrete = M20 grade
 Steel = Fe415 grade
 Sketch the details.

3. Design a reinforced concrete circular shell with the following particulars. 25
 Radius = 3 m
 Span = 15 m
 Semi central angle = 60°
 Thickness of shell = 75 mm
 Sketch the details.

PART - B

- 4 a. Briefly explain yield line theory for analysis of slab. 5
- b. Derive an expression relating yield line moment and ultimate load intensity w_u for a isotropically reinforced simply supported equilateral triangular slab. 10
- c. Design a simply supported square slab of side 3-6 m to carry a service load of 4 kN/m^2 . Adopt M20 grade concrete and Fe415 steel. 10

- 5. A RC grid floor is to be designed to cover a floor area of 12 m x 18 m. The spacing of the ribs in mutually perpendicular directions is 1.5 m c/c. Live load on floor is 3 kN/m². Adopt M20 concrete Fe415 Steel. Assume ends are simply supported. Analyse the grid floor by IS 456-2000 method and design suitable reinforcement in the grid floor. Sketch details of reinforcement. 25

- 6. Design an interior panel of a flat slab with panel size of 6 m x 6 m supported by column of size 500 mm x 500 mm provide suitable drop. Take live load as 4 kN/m². Adopt M20 grade concrete and Fe415 grade steel. Sketch the details. 25

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