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CODE NO:- Z-60

FACULTY OF ENGINEERING & TECHNOLOGY

B.E (Civil) Year Examination - May – 2015

Design of Structures-III

(Revised)

[Time: Four Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

- i) Solve any two questions from section A & B each
- ii) Use of IS: 456, IS:3370, IS: 875 is permitted
- iii) Assume suitable data if required and mention it clearly.

SECTION-A

- Q.1 a) State the situations in which trapezoidal & rectangular footing design is preferred. 03
b) Design a combined rectangular footing for the following data. 17
- i) c/c distance between the columns is 3.7m
 - ii) column A is 400mm × 400 mm with load 1000 kN
 - iii) Column B is 500 mm × 500 mm with load 1300 kN
 - iv) SBC of soil 220 kN/m²
 - v) Grades – M₂₅ and Fe₄₁₅
 - vi) Width of footing = 1.8m
- Show reinforcement detailing
- Q.2 What are the advantages of flat slab construction. Design an interior panel of 6m × 7m of a flat slab to carry a live load of 3.5 kN/m² and floor finish of 10 kN/m². Draw a neat sketch to illustrate the details of reinforcement 20
- Q.3 a) Explain the design principles of various parts of a counter fort retaining wall 03
b) Design heel slab of a counter fort retaining wall for the following conditions 17
- i) Height of embankment above ground level = 6.5m
 - ii) Density of earth = 17 kN/m³
 - iii) Angle of internal friction $\phi = 28^\circ$
 - iv) Safe bearing capacity of soil = 180 kN/m²
 - v) Back fill is horizontal with a surcharge of 20 kN/m
 - vi) Spacing of counter for ts = 4.0m

SECTION-B

- Q.4 a) Explain magnet Blaton system of prestressing using neat sketch 09
b) Differentiate between pretensioning and post tensioning methods of prestressing. 08
c) State the principles of prestressing. 03
- Q.5 a) Design a circular water tank of capacity 200,000 litres. The depth of the tank is limited to 3m from inside. Keep the joint between the wall and the base slab as flexible. The base slab rests on ground use M₃₀ concrete. 07

- b) Design a R.C.C. water tank having the following data. 13
- i) Inner plan dimension = 3.5 m × 6m
 - ii) Depth of water in tank = 3.2m
 - iii) Free board = 0.2m
 - iv) M₂₅ and Fe₄₁₅ grades
 - v) 150mm × 150 mm splays are provided at junctions of walls and base slab.

- Q.6 a) Design a circular slab for a room of 6m effective diameter with fixed edges. Total superimposed load on the slab is 6.0 kN/m². Use M₂₀ & fe₄₁₅ grades show reinforcement detailing 13
- b) Design the formwork for the beam and slab floor, for the following data.
- i) Thickness of floor – 120mm
 - ii) Centre to centre spacing of beams -3m
 - iii) Width of beam is 300 mm
 - iv) And depth 400 mm below slab
 - v) Height of ceiling of the roof=4m above floor
 - vi) Live load = 4 kN/m²
 - vii) Dead weight of concrete (wet) as 26.5 kN/m²