



10CV62

Sixth Semester B.E. Degree Examination, Aug./Sept.2020  
**Design and Drawing of RC Structures**

Time: 4 hrs.

Max. Marks:100

Note: 1. Answer any TWO full questions from Part-A and any ONE question from Part-B.  
2. Use of IS456-2000, SP-16 is permitted.

**PART - A**

- 1 A two way fixed slab over a room of  $6\text{m} \times 4.5\text{m}$  having wall thickness 300mm slab thickness 180mm steel for shorter span  $8\text{mm } \phi @ 130\text{mm c/c}$  longer span  $8\text{mm } \phi @ 180\text{mm c/c}$  corner steel  $8\text{mm } \phi @ 170\text{mm c/c}$ . Draw to a suitable scale following view:
  - a. Plan (08 Marks)
  - b. C/s along longer span and shorter span. (08 Marks)
  - c. Bar bending schedule. (04 Marks)
- 2 A dog legged stair case is provided with in a room of internal dimension  $4.5\text{m} \times 2.5\text{m}$  width of stair 1.2m thickness of waist slab 150mm. Rise 150mm, Tread 250mm, Floor height 3m wall thickness 230mm main steel 10mm diameter @ 150mm c/c Dist. Steel  $8\text{mm } \phi @ 250\text{mm c/c}$ . Draw to a suitable scale
  - a. Plan (08 Marks)
  - b. C/s of ground flight and second flight. (12 Marks)
- 3 A column and footing is to be provided with following details column size  $300 \times 300\text{mm}$  main steel for column 8 - 12mm  $\phi$  lateral ties 8mm diameter @ 300mm c/c column height 4m above the ground footing  $1.9\text{m} \times 1.9\text{m}$  steel for footing 10mm  $\phi @ 100\text{mm c/c}$  both ways. Depth of footing at column face 450mm and 250mm at edge depth of excavation 1.2m. Draw to a suitable scale.
  - a. Plan showing details of reinforcement (08 Marks)
  - b. Sectional elevation showing details of reinforcement. (08 Marks)
  - c. Bar bending schedule. (04 Marks)

**PART - B**

- 4 Design a counterfort retaining wall for the following requirements. Height of wall above GL 5.5m, SBC of soil  $160\text{ kN/m}^2$ , Angle of repose  $30^\circ$ , Density of soil  $16\text{ kN/m}^3$ , Spacing of counterfort 3m c/c. Adopt M20 concrete and Fe 415 steel.
  - a. Design the retaining wall. (40 Marks)
  - b. Draw to a suitable scale.
    - (i) Cross section midway between counter forts (06 Marks)
    - (ii) Cross section at counter forts (06 Marks)
    - (iii) Sectional elevation (04 Marks)
    - (iv) Sectional plan. (04 Marks)
- 5 A hall 10m wide 20m long portal frame are to be provided at 4m c/c portal frame are fixed at base, height 6.5 m. Live load  $1.5\text{ kN/m}^2$  finishing  $0.75\text{ kN/m}^2$ . SBC  $120\text{ kN/m}^2$  M20 concrete Fe 415 steel.
  - a. Design the slab, Portal, T-beam, Column and foundation. (40 Marks)
  - b. Draw to a suitable scale :
    - (i) Cross-section of frame (10 Marks)
    - (ii) Section showing details of reinforcement in slab (continuous slab) (05 Marks)
    - (iii) Details of reinforcement in beam (beam longitudinal section) (03 Marks)
    - (iv) Plan of hall showing position of beam and columns. (02 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8=50$ , will be treated as malpractice.