

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (Sem.-6)  
**DESIGN OF CONCRETE STRUCTURES-II**

Subject Code : BTCE-601

M.Code : 71082

Date of Examination : 02-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

**SECTION-A**

1) Answer briefly :

- a) Define tread and flight.
- b) What is modular ratio?
- c) Define the effective length.
- d) When a shear key is provided in a reinforced concrete retaining wall?
- e) Describe the functions of shear key.
- f) In what ways, circular water tank is preferred over rectangular water tank?
- g) What are the various forces which are considered for the design of dome?
- h) What are the assumptions in design of strap footing?
- i) List the types and pressure acted on the retaining wall.
- j) How can you reduce crack width in R.C. members subjected to tension?

## SECTION-B

- 2) Design one of the flights of stairs of a school building, spanning between beams to suit the following data.

Type of staircase = Waist Type Slab

Number of steps in flights =12

Tread T = 300 mm

Riser R= 160 mm

Width of landing beam = 400 mm

Materials = M20 concrete and Fe415 HYSD bar.

- 3) Design a column of rectangular section subjected to an axial load of 600KN and uniaxial moment of 280KN-m. Consider concrete of grade M-20 and steel of grade Fe-415.
- 4) Design a combined column footing with a strap beam for two RC columns 350mm×350mm size spaced 4 m apart and each supporting a factored axial load of 800 kN. Assume BC of soil as 215 kN/sq.m. Use M-20 grade concrete and Fe415 grade steel.
- 5) Design a conical dome for a hall of diameter 8m and rise 6 m and live and finishes load on the dome is 2kN/m<sup>2</sup>. Use M-20 grade of concrete and Fe-250 steel.
- 6) Draw a neat sketch of counterfort retaining wall.

## SECTION-C

- 7) Design a rectangular water tank resting on ground having base area of 5m × 7m. The height of water tank is 3.90 m and keep a free board of 0.16m. Use M20 concrete and Fe 415 steel. Assume appropriate data and clearly state the assumptions.
- 8) How the beams curved in plan differs from other beams? Derive the equations for Bending Moment, Twisting Moment and Shear Force for a beam circular in plan and supported on columns. Take suitable number of columns.
- 9) Write note on :
- Compression members
  - Overturning moment
  - Biaxial bending.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**