Roll No. Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2012 to 2017) (Sem.–6)

DESIGN OF CONCRETE STRUCTURES-II

Subject Code : BTCE-601

M.Code : 71082

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 the terms ‘riser’ and ‘tread’ in relation to staircases.

b) Under what circumstances rectangular footings are preferred?

c) What is a shear key?

d) What do you mean by ‘biaxial bending’?

e) How will you differentiate between the ‘short’ and ‘long’ column?

f) ‘*Curved beams are subjected to torsional moments only*’. State true or false. Also support your answer.

g) Which type of reinforcement is provided to counter the hoop stresses in the domes?

h) Name the various type of joints used in water tanks.

i) Draw a neat diagram for circular footing.

j) How does the slenderness ratio effects the design of a column?

SECTION-B

2. What are the various thumb rules for proportioning of a staircase?

3. Design a circular water tank with flexible bases for a capacity of 400 kl. The depth of water is 4.5 m. Allow suitable free board.

4. Calculate the maximum bending moment for a semicircular beam supported on 3 equally spaced columns, the centre of columns are on a curve of 10m diameter. The superimposed load is 1500 Kg/m^2.

5. Design a conical dome for hall 10m in diameter Rise of dome is 4m. Live load on the dome may be taken as $2KN/m^2$. Use M20 concrete and Fe250steel.

6. Differentiate between the cantilever and counterfort retaining wall. Why counterforts are provided?

SECTION-C

7. Design a rectangular footing of uniform thickness for an axially loaded column of size 300mm × 600mm. Load on the column is 1100KN. Safe bearing capacity of the soil is 200 KN/m^2. Use M25 concrete and Fe415 steel.

8. Design the stem and heel of a cantilever retaining wall to retain horizontal earthen embankment of height 4m above the ground level. The earthen backfill is having density of 18 KN/m^3 and angle of internal friction as 30°. The safe bearing capacity of the soil is 180 KN/m^3. The coefficient of friction between soil and concrete is assumed to be 0.45. Use M25 concrete and Fe415 steel.

9. Design a column of size 450mm × 600mm having 3m unsupported length. The column is subjected to a load of 2000 KN and is effectively held in position but not restrained against rotation. Use M20 concrete and Fe415 steel.

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.