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SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:[ ]

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B.Tech. || CE || 6th Sem

Design of Concrete Structures II

Subject Code: BTCE-601

Paper ID: (for office use)

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**
- **IS 456-2000, IS 1370, SP16 are allowed in the examination**

PART A (2×10)

Q. 1. Short-Answer Questions: All COs

a) What is a cracked section? Can it take bending moment?

b) What are equivalent section, equivalent shear and equivalent moment in a beam subjected to shear, moment and torsion?

c) What are the type stresses are there in dome structures?

d) What is the difference between section shear and punching shear?

e) What are the assumptions taken in the dome analysis?

f) The soil pressure beneath the foundation is uniformly varying-comment.

g) What are the design considerations of a liquid retaining wall?

h) What are the criteria for selection of a foundation?

i) What are the codes used for liquid retaining structures?

j) What is the balanced foundation? How do we achieve this?

PART B (8×5)

Q. 2. A section is subjected to a direct tension of 200 kN/m and a moment of 30 kNm/m. Design the section on a) uncracked basis b) cracked basis. Use M25 concrete and Fe 415 steel. COa

OR

Design a single flight staircase to cover a horizontal span of 4.5 m if the total vertical rise is 3.6 m. there are total 18 steps to rise. The tread is 250 mm. take live load as 3000 N/m^2 COa

Q. 3. Design a footing for a rectangular column 30 cm x 45 cm carrying an axial service load of 100 kN. The net bearing capacity of soil is 120 kN/m^2. Use M20 concrete and Fe 415 steel. COb

OR

Design a combine footing for two columns carrying axial loads of 500 kN and 800 kN. Both columns are 30 cm in diameter and are spaced 3 m c/c. Columns are reinforced with 18 mm bars and consists of M25 concrete. The bearing capacity of the soil is 80 kN/m^2. Use M20 concrete and Fe-415 steel. COb

Q. 4. Spherical dome of a water tank of span 6m has a rise of 1.20m. it carries al all-inclusive distributed load of 600 N/m^2 and a lantern load of 800 kN at the crown. Design the dome. Use M 20 concrete and Fe 415 steel. COc

OR

A square column of 450mmx450mm is acted upon by 300 kN and Mx=30 kN.m, My= 15 kN.m. The section is reinforced with 8 Nos. 20 mm dia with an effective cover of 30 mm. Check the safety of the section. Concrete used is M20 and steel is Fe 415. COc

Q. 5. A 30 cm x 45 cm ring beam curved in plan is supported on 4 columns located equidistant on a circle of 4 m diameter. The diameter of column is 25 cm and factored load intensity on the ring beam is 100 kN/m. Design the beam with M-20 concrete and Fe 415 steel. COd

OR

Design a T-shaped retaining wall for a height of 5.5m above ground level, It retains earth weighing 16 kN/m^3 and has an angle of repose of 30 deg. Maximum pressure on ground is limited to 120 kN/m^2 COd

Q. 6. Coe

Design a rectangular tank resting on ground for capacity of 80 kiloliters

OR

Design a clear water reservoir of 2000 kl capacity. It is a square in plan and completely underground. The depth of the tank should not be more than 6m. The net bearing capacity of the earth is 100 kN/m^2 and depth of water table is 3m. Assume necessary data and prepare detailed drawings. COe