Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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B.Tech (Civil Engineering) (2011 Onwards E-I & II) (Sem.–7,8)

ADVANCED REINFORCED CONCRETE DESIGN

Subject Code : BTCE-808

M.Code : 71867

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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

Q1 Answer briefly :

(a) What is the purpose of providing counterfort in a retaining wall?

(b) What is the maximum spacing of main and secondary reinforcement that you can provide without causing cracking of slabs?

(c) What is punching shear?

(d) For what purpose a temporary open joint is provided in water tank?

(e) Differentiate between flat slab and two-way slab.

(f) What are the design considerations for the design of heel of a retaining wall?

(g) Name the type of stresses countered in the design of folded plates.

(h) What do you mean by 'Yield line Analysis'?

(i) What is the purpose of providing 'drop' in a flat slab?

(j) What do you mean by a 'Cracked' structure?

SECTION-B

Q2. What are the necessary conditions required to be fulfilled for using the direct design method for the design of the flat slabs?

Q3. Write a brief note on the structural behaviour of cylindrical shells.

Q4. Design a circular water tank with flexible base for a capacity of 500 KL. The depth of water is 5.5 m. Allow suitable free board.

Q5. Design a rectangular slab of size 4m × 6m which is simply supported along the edges and has to carry a service live load of 5 KN/m^2. Assume coefficient of orthotropy as 0.75. Use M25 concrete and Fe415 steel. The design may be restricted to bending only.

Q6. Explain with the neat sketches 'types of shell roofs'.

SECTION-C

Q7. Using the yield line analysis, design the floor slab of a office room of size 5m X 5M. Use M25 concrete and Fe415 steel. Also sketch the reinforcement.

Q8. Design a chimney of height 65 m for the given data :

External diameter (i) at top : 3.5 m

(ii) at base : 4.2 m

Shell thickness (i) at top : 200 mm

(ii) at bottom : 400 mm

Wind intensity 1.6 KN/m^2 throughout

Thickness of fire brick lining : 90 m

Air gap : 100 mm

Temperature difference : 75°C

Coefficient of thermal expansion : 11 × 10^6/C°

Es = 210 × 10^6

Unit weight of brick lined = 20 KN/m^3

Use M30 concrete and Fe415 steel.

Q9. Design a counterfort retaining wall if the height of wall above the ground level is 5.0 m. SBC of soil = 189 KN/m^3, angle of friction as 300 and unit weight of backfill is 18 KN/m^3. Keep spacing of counterforts as 3.5 m. Coefficient of friction between soil and concrete is 0.5. Use M25 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.