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

Total No. of Pages : 02

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B.Tech (Civil Engineering) (2012 to 2017) (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.
4. No Indian codes of practice and design handbooks are permitted.

SECTION-A

1. Answer briefly :

a. What are the stability requirements for retaining wall?

b. Define Yield Line and draw it for rectangular slab.

c. What are the stability checks in case of retaining wall?

d. What are the types of tanks?

e. What are the characteristics features of yield line?

f. What are the limitations of direct design method for flat slab?

g. What is structural action between cantilever and counter fort type retaining wall?

h. What is the function of weep holes in retaining wall construction?

i. What forces act on chimney?

j. What is the thickness of flat slab with drops and without drops?

SECTION-B

2. Design a counter fort retaining wall, if the height of the wall is 5.5m above G.L. SBC of soil is 180kN/m^2. Angle of friction is 30°, unit weight of backfill is 18kN/m^3. Keep spacing of counter fort as 3m.

3. Design a flat bottom circular water tank of dia 10m and total height 4m which is to be supported by ring beam of 7.5m diameter. The ring beam is to be supported by six columns equally spaced. Use M25 concrete and Fe 415 steel. Design the ring beam and cylindrical wall.

4. Write a short note on Analysis of stresses in concrete chimney.

5. Design a rectangular slab of size 4mx6m which is simply supported along the edges and has to carry a service live load of 4kN/m^2. Assume co-efficient of orthotropy as 0.75. Use M20 concrete and Fe 415 steel.

6. What are the advantages and disadvantages of flat slab?

SECTION-C

7. State the rules for predicting yield patterns and locating the axes of rotation of slabs with different plan forms and boundaries. Derive the moment curvature relation of reinforced concrete section.

8. A reinforced concrete rectangular beam 400mm wide and 525 mm deep is reinforced with 4 bars of 20mm dia at bottom and 4 bars of 12 mm dia at top. Determine the strength of the beam section in torsion, if it is also subjected to ultimate bending moment of 50 kN-m and ultimate shear of 20 kN. Assume M20 grade concrete, Fe 415 grade of steel.

9. Write short notes on the following :

   a. Structural behavior of cylindrical shell and folded plate

   b. Codal provisions for shells and folded plates.

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.