Paper Code: CE-601	**Roll No.**									

B.Tech.

(SEM VI) EVEN SEMESTER EXAMINATION 2015-16

DESIGN OF CONCRETE STRUCTURES - 2

[Time: 3 hrs.] **[Max. Marks: 100]**

Note: (i) Attempt ALL questions.
(ii) Marks are indicated against each question.
(iii) Assume any data suitably, if required.
(iv) IS 456: 2000 is permitted. Use M20 concrete and fe415 steel.

1. Attempt any **Two** parts of the following:- **10x2=20**

(a) A reinforced concrete wall 250mm thick carries a load of 600KN/m inclusive of self weight. Design the R.C. Footing on soil having safe bearing capacity of 170KN/m^2 at 1m below ground level. Show the Reinforcement details.

(b) Design a isolated footing of uniform thickness for a Reinforced concrete column carrying a vertical axial load of 700KN.The size of column is 500mmx500mm. Taking safe bearing capacity of soil as 130KN/m^2 at 1.2m depth below ground. Show the reinforcement details.

(c) Discuss the various types of Shallow and Deep foundations used for buildings along with their condition of uses under various soil conditions, with their neat sketches.

2. Attempt any **Two** parts of the following **10x2=20**

(a) Discuss with neat sketches the various types of RCC retaining walls used in field to protect the backfill soil.

(b) Fix the dimension of a cantilever retaining wall to retain a earth embankment of 5m hifh above ground level, The unit weight of earth is 20KN/m^3 and the angle of repose is 30^0.The backfill is horizontal at its top. Take safe bearing capacity of soil as 110KN/m^2 and coefficient of friction as 0.5. Check the stability of the Retaining wall.

(c) Design the stem slab,Toe slab and heel slab of the retaining wall in part **(b)** and show the Reinforcement details .

3. Attempt any **Two** parts of the following **10x2=20**

(a) Design a section of a vertical wall of a water tank subjected to an axial force of 200KN/m. Use M25 concrete &fe 415 steel. Draw the reinforcement details.

(b) What is Intz tank? Where it is used? Draw the neat sketch of a Intz type overhead water tank supported with columns and braces on annular raft foundation. The depth of footing is 2m below ground level. Showing all the structural elements of the tank, Discuss in brief, how the container of the tank is designed by using membrane theory.

(c) A curved beam circular in plan is loaded with uniform load of 170KN/m inclusive of self weight. The radius of the beam is 5m. The beam is supported on six symmetrically placed columns.

i. Draw the Shear force, bending moment and torque diagrams for one of the spans showing all critical values. Also locate the point of inflection. Show all critical values.

ii. Design the support section for maximum bending moment

4. Attempt any **Two** parts of the following **10x2=20**

(a) What do you understand by Pre Stressed concrete? Discuss the Pre tensioning and Post tensioning methods of Pre stressing with neat sketches.

(b) Discuss the various types of losses which occur in pre stressed concrete along with how each of them is calculated.

(c) Explain with neat sketches the different types of Post tensioning devices used in post tensioning method of pre stressing.

5. Attempt any **Two** parts of the following **10x2=20**

(a) What is a Flat Slab? What are its advantages over conventional two way slab? Discuss the different types of Flat slabs construction as recommended by IS code along with neat sketches.

(b) Analyse an interior panel and find the bending moments and shear force in column strip and middle strip, of a flat slab having panel size 6mx6m. The panels have drops 3mx3m size. The depth of drop is 200mm.The internal column are500mm diameter and column head is 1000mm in diameter. The storey height above and below slab is 4m.The slab is subjected to Dead load of $3KN/m^2$ and live load of $4KN/m^2$.

(c) What are the various methods of Design of flat slabs? Discuss the Direct Design method in detail.