

Roll No. ....

**2371**

**B. E./B. Tech. 6th Semester (Civil Engg.)**

**Examination – May, 2014**

**Design of Concrete Structures - II**

**Paper : CE-302-E**

*Time : Three hours ]*

*[ Maximum Marks : 100*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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**Note :** Attempt any *five* questions. Use of Is 456 is allowed.

1. A curved beam is in form of a full continuous circle in plan with a radius of 3m and is supported continuously on five supports. The beam carries a uniformly distributed load of 30 KN/m length, inclusive of its own weight. Determine the bending moment, twisting moment and shear force at salient location. 20

Design a dog-legged staircase for a building in which the vertical distance between floors is 3.6m. The stair hall measures 2.5m x 5m. The live load may be taken as  $2500 \text{ N/m}^2$ . Use M15 concrete and HYSD bars. 20

Two reinforced concrete column 400mm x 400mm in section carry a load of 1000 KN each, inclusive of self weight. Design a combined footing having central beam joining the columns. The centre to centre spacing of the columns is 4m. The safe bearing capacity of soil is  $150 \text{ KN/m}^2$ . Use M15 mix. 20

Design a circular tank for a capacity of 400,000 litres. The depth of the water is to be 4m, including a free board of 200mm. Use M20 concrete. 20

Classify various types of prestressing techniques used. What are different types of losses that can occur during prestressing. 20

What do you understand by a substitute frame. Discuss in brief the method of analysis. Explain the portal and cantilever method for analyzing a building frames subjected to horizontal forces. 20

A reinforced concrete slab 5m x 5m is supported along the four edges and is reinforced with 10mm dia mild steel bars at 150 mm c/c both ways. The average effective depth of the slab is 100 mm and the overall depth of the slab is 130 mm. The slab carries a flooring of 50 mm thick having unit weight of  $2.2 \text{ KN/m}^2$ . Determine the maximum permissible service load, if M15 concrete is used. 20