Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14CE2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Reinforced Concrete Structures** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Draw the stress strain curve for steel and mark the salient points. | CO1 | **4** |
| b. | Elaborate the design philosophies highlighting the advantages of different methods. | CO1 | **16** |
| **(OR)** | | | | |
| 2. |  | Design a simply supported slab of 7.5 x 3.5 m supported on 230mm walls. Assume live load as 4 kN/m2 and floor finish of 1kN/m2. Use M20 concrete and Fe415 steel. | CO2 | 20 |
| 3. | a. | Find τc value when the % of steel is 0.6 and grade of concrete is M20 | CO2 | **2** |
|  | b. | Under what circumstances will you go for doubly reinforced sections? | CO3 | **2** |
|  | c. | A simply supported beam of size 350x700mm effective depth has to resist a factored moment of 450kNm and grade of concrete is M20.Design the reinforcement in the beam. | CO2 | **16** |
| **(OR)** | | | | |
| 4. |  | Design a beam of span 4m supported on walls 230mm thick. The load on the beam is 15kN/m. Use M20 concrete and Fe415 steel. | CO2 | **20** |
| 5 |  | Find the moment of resistance of T-beam and suggest the economical section, having the following data  bf = 750mm, d= 500mm, bw= 250mm, Ast= 1160mm2. Use M20 concrete and Fe415 steel, when   1. Df= 90 mm 2. Df= 130mm   iii ) Df=110mm | CO3 | **20** |
| **(OR)** | | | | |
| 6. | a. | Define slenderness ratio. | CO1 | 1 |
|  | b. | What is the minimum % of steel to be used in column. | CO2 | 1 |
|  | c. | Why exterior columns are designed for uniaxial moment? | CO3 | 2 |
|  | d. | What is the minimum eccentricity for design of column? | CO2 | 2 |
|  | e. | Design a short square column of size 450mm with effective length of 3.0m capable of safely resisting a factored load of Pu=1200kN. Use M20 concrete and Fe415 steel | CO2 | 14 |
| 7. | a. | Which column is subjected to biaxial bending? | CO3 | **1** |
|  | b. | What is the effective length of column effectively held in position and restrained against rotation at both ends? | CO2 | **1** |
|  | c. | Differentiate between short and long column. | CO3 | **2** |
|  | d. | What is the condition for eccentricity to design the column as axially loaded column? | CO3 | **2** |
|  | e. | Design a circular column of size 400mm with effective length of 3.5m to resist a factored load of Pu=1300kN and Mu=125kN.m. Use M20 concrete and Fe415 steel. | CO2 | **14** |
| **(OR)** | | | | |
| 8. | An RC column 400 x 400mm in section carries an axial load of 750kN. Design the footing for the column using M20 concrete and Fe415 steel. | | CO2 | **20** |
|  |  |  |  |  |
| **Compulsory:** | | |  |  |
| 9. | Design a dog-legged stair for a buildingin which the vertical distance between floors is 3.6m. the stair hall measures 2.5 m x 5 m. The live load may be taken as 3000N/m2. Use M20 concrete and Fe415 steel. | | CO2 | **20** |

ALL THE BEST