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

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**End Semester Examination – Nov / Dec – 2019**

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| **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. | Define characteristic strength and mention the relation between cube and cyclinder strength. | CO1 | 4 |
| b. | Differentiate between working stress method, limit state method and ultimate load method. | CO1 | 16 |
| **(OR)** | | | | |
| 2. |  | Design a simply supported slab of 5 x 2 m supported on 300mm walls. Assume live load as 2.5 kN/m2 and floor finish of 1 kN/m2. Use M20 concrete and Fe415 steel. | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Write the minimum longitudinal reinforcement to be provided in beams. | CO2 | 2 |
| b. | Differentiate between singly and doubly reinforced sections. | CO3 | 2 |
| c. | A simply supported beam of size 300 x 500mm oveall depth has to resist a factored moment of 450 kNm and grade of concrete is M20. Design the reinforcement in the beam. | CO2 | 16 |
| **(OR)** | | | | |
| 4. |  | Design a beam of span 5 m to carry a load of 25 kN/m in addition to its self weight. The beam rests on supports of 300mm width. Use M20 concrete and Fe415 steel. | CO2 | 20 |
|  |  |  |  |  |
| 5 |  | Find the moment of resistance of T-beam for the following data.  bf = 750mm, d= 500mm, bw= 250mm, Df=110mm. Use M20 concrete and Fe415 steel,  when i) Ast= 700mm2  ii) Ast= 1160mm2 iii) Ast= 1800mm2 | CO3 | 20 |
| **(OR)** | | | | |
| 6. | a. | Differentiate between interior, exterior and corner columns. | CO3 | 4 |
| b. | Design a square column of size 500mm with effective length of 3.0 m capable of safely resisting a factored load of Pu=1500kN. Use M20 concrete and Fe415 steel. | CO2 | 16 |
|  |  |  |  |  |
| 7. | a. | Differentiate between short and long column. | CO3 | 4 |
| b. | Design a column of size 300 x 500 mm with effective length of 3.2m to resist a factored load of Pu=1000kN and Mu=100kN.m. Use M20 concrete and Fe415 steel. | CO3 | 16 |
| **(OR)** | | | | |
| 8. |  | An RC column 500 x 500mm in section carries an axial load of 1200kN. Design the footing for the column using M20 concrete and Fe415 steel. The safe bearing capacity of soil may be taken as 200kN/m2 | CO2 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Design a dog-legged stair for a building in which the vertical distance between floors is 3.2m, the stair hall measures 2.5 m x 5 m. The live load may be taken as 3 kN/m2. Use M20 concrete and Fe415 steel. | CO2 | 20 |