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 – 2017**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14CE2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **REINFORCED CONCRETE STRUCTURES** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Draw the stress strain block diagram of limit state method. | CO1 | 4 |
| b. | Discuss the design philosophies which are used for the design of RCC section. | CO1 | 16 |
| (OR) | | | | |
| 2. |  | Design a simply supported slab of 7 x 3 m supported on 230mm walls. Assume live load as 3 kN/m2 and floor finish of 1kN/m2. Use M25 concrete and Fe415 steel. | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Determine the value of τc when the % of steel is 1.6 and grade of concrete is M20. | CO2 | 2 |
|  | b. | Define under reinforced beam section? | CO3 | 2 |
|  | c. | A simply supported beam of size 300x600mm 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 3.5m supported on walls 230mm thick. The load on the beam is 12kN/m. 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, Ast=1160mm2. Use M20 concrete and Fe415 steel, when i. Df= 90 mm ii. Df= 130mm iii. Df=110mm | CO3 | 20 |
| (OR) | | | | |
| 6. | a. | Define slenderness ratio | CO1 | 1 |
|  | b. | Mention the maximum % of steel can be used in column. | CO2 | 1 |
|  | c. | Differentiate short and long column? | CO3 | 2 |
|  | d. | Recall the minimum eccentricity to be considered for the design of column? | CO2 | 2 |
|  | e. | Design a short square column of size 450x450mm with effective length of 3.5m capable of safely resisting a factored load of Pu=1000kN. Use M20 concrete and Fe415 steel. | CO2 | 14 |
|  |  |  |  |  |
| 7. | a. | Explain Axially loaded, uniaxially loaded and biaxial loaded columns with examples and neat sketch. | CO3 | 3 |
|  | b. | Write the effective length of column effectively held in position and restrained against rotation at both ends? | CO2 | 1 |
|  | c. | Design a circular column of size 300mm with effective length of 3m to resist a factored load of Pu=800kN and Mu=75kN.m. Use M20 concrete and Fe415 steel. | CO2 | 16 |
| (OR) | | | | |
| 8. |  | A RC column 400 x 400mm in section carries an axial load of 600kN. Design the footing for the column using M20 concrete and Fe415 steel. The safe bearing capacity of soil may be taken as 250kN/m2. | CO2 | 20 |
|  |  |  |  |  |
|  | | **Compulsory:** |  |  |
| 9. |  | Design a dog-legged stair for a building in which the vertical distance between floors is 3.6m. The stair hall measures 2.5 m x 5.6 m. The live load may be taken as 3.5kN/m2. Use M20 concrete and Fe415 steel. | CO2 | 20 |

ALL THE BEST