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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

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

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **09CE210/ 12CE217/CE249** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **REINFORCED CONCRETE STRUCTURES - I** | **Max. marks:** | **100** |

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| **Q. No.** | **Questions** | **Marks** | |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | What is under reinforced section? | (1) |
| 2. | Mention any two different methods of design. | (1) |
| 3. | What are the reasons for cracking in structural concrete? | (1) |
| 4. | What is one way slab? | (1) |
| 5. | What is long column? | (1) |
| 6. | Mention the failure of short column when subjected to compressive load. | (1) |
| 7. | Define Effective length. | (1) |
| 8. | What are the different types of columns? | (1) |
| 9. | What is the minimum reinforcement to be provided in slabs when Mild steel is used? | (1) |
| 10. | What is the formula used for checking cracking tensile stress in a water tank? | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | Explain the term limit state design. | (3) |
| 12. | Differentiate between under-reinforced, over-reinforced and balanced sections. | (3) |
| 13. | How to classify the columns based on Loadings? | (3) |
| 14. | Draw out the various possible geometries of T-Beams. | (3) |
| 15. | Write down the general design procedure for WSD. | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | Explain stress – strain characteristics of concrete. | (15) |
| (OR) | | | |
| 17. |  | Determine the area of reinforced required for a singly reinforced section having a breadth of 300 mm and effective depth of 675 mm to support a factored moment of 185 kNm. Adopt fck = 20N/mm2 and fy=415 N/mm2 | (15) |
| 18. |  | Design an R.C slab for a room measuring 5m x 6m size. The slab is simply supported on all four edges, with corners held down and carries a superimposed load of 3000 N/m2, inclusive of floor finishes etc. Use of M 20 and Fe 415 steel. | (15) |
| (OR) | | | |
| 19. |  | Explain the design procedure for two way slabs. | (15) |
| 20. |  | Design a reinforced concrete beam supported on two walls 500 mm thick, spaced at a clear distance 6 m. The beam carries a super-imposed load of 30 kN/m. The size of the beam is restricted to 300 mm x 500 mm. Use M 20 concrete and Fe 415 steel. | (15) |
| (OR) | | | |
| 21. |  | Design an axially loaded tied column 400 X 400 mm pinned at both ends with an unsupported length of 3m for carrying a factored load of 2300kN. Use grade 20 concrete and Fe 415 steel. | (15) |
| 22. |  | A reinforced concrete beam of rectangular section 300 mm wide by 650 mm overall depth is reinforced with 4nos – 32 mm diameter at an effective depth of 600 mm use M-20 concrete and Fe 415 grade steel. Estimate moment of resistance of section. | (15) |
| (OR) | | | |
| 23. |  | A column 400 mm x 400 mm in section carries an axial load of 1200 kN.Design isolated sloping footing. SBC of the soil is 250 kN/m2. | (15) |
| 24. |  | Design a circular short column 400 mm in diameter to support an axial load of 800 kN. Use M20 grade and adopt the stress in steel as 130 N/mm2. | (15) |
| (OR) | | | |
| 25. |  | Design a circular water tank with flexible connection at base for a capacity of 4,00,000 liters. The tank rests on a firm level ground. The height of tank including a free board of 200 mm should not exceed 3.5m. The tank is open at top. Use M 20 concrete and Fe 415 steel. | (15) |

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