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

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**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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| **Code :** | **09CE217/CE250** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Reinforced Concrete Structures II** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | |
| 1. | Mention any two types of stairs. | | (1) |
| 2. | Reason out the purpose of shear key. | | (1) |
| 3. | What is the critical condition for the design of underground water tank? | | (1) |
| 4. | What are the stresses to be considered in design of dome of a circular water tank? | | (1) |
| 5. | What are the common types of reinforced concrete bridge decks? | | (1) |
| 6. | What are kerbs? | | (1) |
| 7. | Which code has to be referred for ductile detailing of structural element? | | (1) |
| 8. | As per Indian standard code, which method should be adopted for the multi-storey building analysis? | | (1) |
| 9. | What is an orthotropic slab? | | (1) |
| 10. | Draw the yield line pattern for square slab fixed at all edges. | | (1) |
| **PART B(5 X 3= 15 MARKS)** | | | |
| 11 | Brief the behavior of cantilever retaining wall with neat sketch. | | (3) |
| 12 | Write the steps involved in design of staging of water tank. | | (3) |
| 13 | Write a note on IRC Class AA loading. | | (3) |
| 14 | Brief the base shear calculation. | | (3) |
| 15 | Brief the characteristics features of yield lines. | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | Design a dog-legged stair 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 2.5kN/m2. Use M20 and Fe415. | (15) |
| (OR) | | | |
| 17. |  | Design the stem of a cantilever retaining wall to retain earth with a backfill sloped at 20o to the horizontal. The top of the wall is 5.5m above the ground level and the foundation depth may be taken as 1.2m below ground level with a safe bearing capacity of 120kN/m2. Assume that the backfill has a unit weight of 17kN/m2 and an angle of shearing resistance of 35o. Further assume a coefficient of friction between soil and concrete is 0.55. | (15) |
| 18. |  | Design an underground water tank 4m x 6m x 2m deep. The subsoil consists of dune sand having unit weight of 16000N/mm3 and angle of internal friction of 34o.The subsoil water is at great depth. Use M20 and Fe415 steel. | (15) |
| (OR) | | | |
| 19. |  | Design a circular water tank with flexible base for capacity of 4,00,000 liters. The depth of water is to be 4m. Free board is 200mm. Use M20 grade concrete and Grade I mild steel. | (15) |
| 20. |  | Design a solid slab bridge for Class AA loading for the following data.  Clear Span : 6.5m  Clear width of roadway : 7.5m  Thickness of wearing coat : 7.5cm  Use M20 concrete and Fe415 steel | (15) |
| (OR) | | | |
| 21. |  | What is Courbon’s method? Explain the method with neat sketch and its applications in detail. Specify the conditions under which Courbon’s method of bridge design is suitable. | (15) |
| 22. | a. | Explain in brief about the construction practices of reinforced concrete building and the lessons learnt from damages of RC buildings. | (10) |
| b. | Give the steps involved to determine the equivalent seismic force on the building at each floor. | (5) |
| (OR) | | | |
| 23. |  | Using portal method analyze the building frame in the Figure to determine the axial force and bending moment in the column AB at A.  3 m  3 m  3.8 m  3 m  20 kN  30 kN  A  B | (15) |
| 24. |  | A square slab of side length 4m is simply supported at the ends and carries a service load of 3kN/m2. Design the slab. Use M20 and Fe415 steel. | (15) |
| (OR) | | | |
| 25. |  | Derive an expression for moment of an orthotropically reinforced rectangular slab simply supported on all edges. | (15) |

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