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



**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **17CE3001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED 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. | A Tee beam is continuous over two spans of 8m each with flange width of 1.2 m, web width 0.3m with 0.8m beam depth and 150 mm slab thickness. It carries UDL factored load of 75 kN/m. Check whether the maximum moment can be reduced by 30% and redistributed to spans. Use M20 concrete and Fe 415 steel. | CO1 | 14 |
| b. | Elaborate the stress-strain behavior of the section and the method to determine the neutral axis of various sections in limit state design. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | A simply supported rectangular beam of 300 mm wide by 550 mm overall depth is reinforced with 3 bars of 25 mm diameter. Two hanger bars of 12 mm diameter are provided at the compression face. The effective span of the beam is 5m. The beam is subjected to a sevice load moment of 140kN.m at the mid span. Check the beam for the serviceability limit states of cracking by IS code and Eurocode. Use M20 concrete and Fe415 steel. | CO5 | 14 |
| b. | A singly reinforced concrete beam having a width of 300 mm is reinforced with 4 Nos. of 28 mm dia. At an effective depth of 400 mm. If M20 grade concrete and Fe415 HYSD steel bars are used, compute the ultimate flexural strength of the section. | CO1 | 6 |
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| 3. | a. | A sports complex of size 20 m x 20 m with 5m panels in both directions is loaded with 4 kN/m2 loading. Design the interior panel of a flat slab using M20 concrete and Fe415 HYSD bars. | CO4 | 14 |
|  | b. | Discuss the loading pattern in the Equivalent frame method design of flat slab with neat sketch and the limitations of Direct design method of Flat slab. | CO2 | 6 |
| (OR) | | | | |
| 4. | a. | Compute the torsional moment distribution in the edge beam of a flat slab as per ACI 318. Edge beam of size 300 mm x 550 mm with 150 mm flat slab thickness is subjected to a max. torsional moment of 35 kN.m. Use M20 concrete and Fe 415 steel. | CO2 | 14 |
|  | b. | Suggest the opening provisions in flat slab with neat sketch. | CO2 | 6 |
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| 5. | a. | A prisamatic trough shaped folded plate supports a live load of 0.4 kN/m2 in addition to the self weight. Estimate the stresses developed in the plate at mid section if the plates BC, CD and DE are 120 mm thick and end plates AB and EF are 250 mm thick. Span of the folded plate is 8 m. | CO1 | 15 |
|  | b. | Elaborate the general specifications of shells. | CO3 | 5 |
| (OR) | | | | |
| 6. | a. | Design a conical dome roof for a room with base diameter as 12m with roof height 4m. The live load may be taken as 1 kN/m2. Use M20 concrete and Fe415 steel. | CO4 | 15 |
|  | b. | Discuss the advantages of folded plate roof than shell roof. | CO2 | 5 |
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| 7. | a. | Design a circular bunker to store 20 tonnes of coal. Density of coal is 9kN/m2, Angle of repose is 300. Use M20 concrete and Fe415 steel. | CO4 | 15 |
|  | b. | Elaborate the major reasons for building failures. | CO6 | 5 |
| (OR) | | | | |
| 8. | a. | A cement silo has an internal diameter of 10 m and 30 m deep with a conical hopper bottom. The density of cement is 15.2 kN/m3. Coefficient of friction between wall and material is 0.7. Angle of repose is 17.50. Design the cylindrical portion of the silo using M20 concrete and Fe415 steel. | CO4 | 15 |
|  | b. | Brief the forces acting on RC walls and its structural behavior. | CO3 | 5 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Results of cube tests on a project with continuous production of concrete was obtained for grade of concrete M35 as;    Recommend the quality of the concrete for further construction. | CO5 | 15 |
|  | b. | Discuss the structural behavior of joints. | CO3 | 5 |

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