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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17CE3023** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ANALYSIS AND DESIGN OF PRECAST 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. | Brief the materials used in precast structures. | CO1 | 10 |
| b. | Explain the factors that influence the Precast concrete structures. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Explain the erection techniques in precast concrete construction. | CO2 | 10 |
| b. | Brief the limitations on precast construction design. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Discuss the structural design of individual precast units in detail. | CO4 | 7 |
| b. | Design a bearing pad for a simply supported prestressed concrete beam. Assume that there is only one span with no movements of the supports.  Length, L = 12m  Width, b = 300mm  Width of supporting member, h = 200mm  Edge distance,le = 90mm  N = 300kN  Rotation, φ = 100% = 0.01 radians  Horizontal movement of beam ends = 0.5 ε L | CO3 | 13 |
| (OR) | | | | |
| 4. | a. | Describe the design loads on beams and frames in precast concrete structures. | CO4 | 10 |
| b. | Differentiate the Precast concrete construction and In-situ concrete construction. | CO4 | 10 |
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| 5. | a. | Brief the connection design in precast concrete structures. | CO5 | 7 |
| b. | An internal column carries a symmetrical arrangement of two beams, which in turn carry a symmetrical arrangement of floor slabs. The column grid is 6 x 6m. The characteristic floor loading is 10kN/m2. If the central column was to be removed in an accident, calculate the magnitude of the beam and slab tie force required to establish a new equilibrium sagging position. | CO5 | 13 |
| (OR) | | | | |
| 6. | a. | In joints of precast concrete bridge segments, brief the functions of applying epoxy adhesive. | CO6 | 10 |
| b. | Describe the design loads on beams and frames in precast concrete structures. | CO5 | 10 |
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| 7. | a. | Brief the Precast concrete shear walls and the distribution of horizontal loading. | CO5 | 10 |
| b. | Describe the seismic response on the structural elements of precast concrete structure with neat sketches. | CO5 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the measures to be taken for the safety against progressive collapse in precast concrete construction. | CO5 | 10 |
| b. | Brief the failure modes of precast concrete. | CO5 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Enlist the types of beam and column connections with neat sketches. | CO6 | 10 |
| b. | Write short notes on (i) Reinforced and plate reinforced concrete bearing in compression joints. (ii) Shear adhesion and bonding | CO6 | 10 |