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



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

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| **Code :** | **14CE2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **STRUCTURAL ANALYSIS** | **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. | The horizontal displacement at support D is to be determined for the frame shown in figure. Take E = 200 GPa. I = 300 x 106 mm4. Analyze the frame by virtual work method. | CO1,CO3 | | 12 |
| b. | Calculate the deflection at the midspan of a simply supported beam of span ***L*** when it carries a Point load at the centre of the span using Castigliano’s first theorem. | CO3 | | 8 |
| (OR) | | | | | |
| 2. |  | Using Castigliano’s second theorem determine the vertical and horizontal deflection components of joint C of the truss shown in figure. E = 200 GPa. Cross sectional area of each bar is 100 mm2 | | CO1,  CO3 | 20 |
| 3. |  | Analyze the beam shown in Fig.by slope deflection method? Draw BMD EI is constant. | | CO3 | 20 |
| (OR) | | | | | |
| 4. |  | Analyse the rigid frame shown in figure by slope deflection method and determine the reactions and moments. | | CO3 | 20 |
| 5. |  | Analyse the continuous beam ABCD shown in figure by moment distribution method and draw the BMD. | | CO3 | 20 |
| (OR) | | | | | |
| 6. |  | A rigid jointed portal frame ABCD is loaded as shown in figure. Determine the member end moments by moment distribution method. EI is same throughout. | | CO3 | 20 |
| 7. |  | Two point loads of 100 kN and 200 kN spaced 3m apart cross a girder of span 15m from left to right with 100kN load leading. Draw the influence line diagram for shear force and bending moment at a section D, 6m from left hand support. Also find the absolute maximum bending moment. | | CO2 | 20 |
| (OR) | | | | | |
| 8. |  | Four equal loads of 150 kN each equally spaced at 2m apart followed by udl of 60 kN/m at a distance of 1.5m from last 150 kN load cross a girder of 20 m span from left to right. Using influence line calculate shear force and bending moment at section 8 m from left hand support when leading 150 kN load is 5m from left hand support. | | CO2 | 20 |
|  | | **Compulsory**: | |  |  |
| 9. |  | Analyse the frame shown in figure and evaluate approximately the column end moments, beam end moments and reactions. | | CO3 | 20 |

ALL THE BEST