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

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

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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. | Differentiate between statically determinate structures and statically indeterminate structures. | CO1 | 2 |
| b. | State the principle of virtual force. | CO1 | 2 |
| c. | A simply supported beam of span 6m is subjected to a concentrated load of 45kN at 2m from the left end support. Calculate the deflection under the point load. TakeE = 200 x 106kN/m2 and I = 14 x 10-6 m4. | CO1 | 16 |
| (OR) | | | | |
| 2. |  | Find the vertical deflection at joint B of the pin-jointed frame shown in figure below. AE is constant for all members. | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | A simply supported beam has a span of 15m and is subjected to a uniformly distributed load of 40kN/m, 5m long traversing from left to right. Draw the influence line diagram for shear force and bending moment at a section 6m from left end. Use this diagrams to calculate maximum shear force and bending moment at this section. | CO1 | 20 |
| (OR) | | | | |
| 4. |  | A girder having a span of 18m is simply supported at the ends. It is traversed by a train of loads as shown in figure below, the 50kN load leading. Find the maximum bending moment which can occur:  a. Under the 200kN load;  b. Under 50kN load using influence line diagram. | CO1 | 20 |
|  |  |  |  |  |
| 5. |  | Analyse the continuous beam shown in figure by Slope Deflection Method and draw bending moment and shear force diagrams. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Analyse the frame shown in figure by slope deflection method. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | A continuous beam ABCD 20m long is simply supported at its ends and it is propped at same level B and C as shown it is loaded as shown in figure.  If support B is sunk by 10mm, analyse the beam using moment distribution method and sketch the bending moment diagram. Take E = 2.1 x 105 N/mm2 and I = 85 x 105 mm4. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Analyse the structure loaded as shown in figure by moment distribution method and sketch the bending moment and shear force diagrams. | CO2 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Analyse the frame shown in figure and evaluate approximately the column end moments, beam end moments and reactions. | CO2 | 20 |