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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

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

**End Semester Examination – April / May – 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 | Marks |
| 1. | a. | Determine the deflection of the given beam by strain – energy method. | 10 |
| b. | Using Castigliano’s method, obtain the deflection under the point load of 60 kN applied at 4m from the left support of a simply supported beam of span 6m. EI = 2.2 MNm2. | 10 |
| (OR) | | | |
| 2. |  | Using the principle of virtual work, obtain the deflection under the point load of 50 kN applied at 2.2m from the left support of a simply supported beam of span 5m. EI = 2.2 MNm2. | 20 |
| 3. |  | Two wheel loads of 16 kN and 8 kN, spaced at 2 m apart, cross a beam of span 10m. Draw the influence line for SF and BM at a point 4 m away from the left support. Find the maximum SF and BM at that point. Also determine the absolute maximum bending moment and Shear force. | 20 |
| (OR) | | | |
| 4. |  | A UDL of 60 kN/m and length 5 m rolls over a girder of span 16 m. Find the maximum positive and negative shear force, maximum BM at a section 6 m from the left end.Also determine the absolute maximum bending moment and Shear force. | 20 |
| 5. |  | Analyse a continuous beam ABCD consisting of 3 spans and loaded as shown in the figure using moment distribution method. Ends A and D are fixed. Determine the bending moments at the supports and plot the BMD. | 20 |
| (OR) | | | |
| 6. |  | Analyse the portal frame loaded as shown in figure by the Moment Distribution method and sketch the bending moment and shear force diagram. | 20 |
| 7. |  | Analyse a continuous beam ABCD consisting of 3 spans and loaded as shown in the figure using Slope Deflection method. Determine the bending moments at the supports and plot the BMD.  Image result for Slope deflection method | 20 |
| (OR) | | | |
| 8. |  | Analyse a continuous beam ABC consisting of 2 spans and loaded as shown in the figure using Slope Deflection method. Determine the bending moments at the supports and plot the BMD.  Image result for Slope deflection method | 20 |
|  | | **Compulsory:** |  |
| 9. |  | Use portal method to perform an approximate method of analysis of the frame given in figure. | 20 |