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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14CE2030** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED 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 three hinged parabolic arch, hinged at the crown and springing, has a horizontal span of 15m with a central rise of 3m. It carries a uniformly distributed load of 32kN/m over the left hand half of the span. Calculate the normal thrust, radial shear and bending moment at 5m from the left hand hinge. | CO1 | 20 |
| **(OR)** | | | | |
| 2. |  | A three hinged parabolic arch of span 30m has its supports at depths of 4m and 16m below crown C. The arch carries a load of 80kN at a distance of 5m to the left of C and a second load of 100 kN at 10m to the right of C. Determine the reaction at supports and bending moments under the loads. | CO1 | 20 |
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| 3. |  | A suspension cable of uniform material is hung between 2 points A & B separated by a horizontal distance of 92m and carries a UDL of 25 kN/m. The maximum dip of the cable measured from points A and B are 8m and 4m respectively. Determine the horizontal component of tension in the cable. Also determine the length of the cable required. Neglect the self-weight of the cable. | CO4 | 20 |
| **(OR)** | | | | |
| 4. |  | A cable of horizontal span 35 m is to be used to support 6 loads of 40,50,60,60,50,40 kN at 5m spacing. The central dip of the cable is limited to 3. Find the length of the cable required and also its sectional area if the safe tensile stress is 750N/mm2. | CO4 | 20 |
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| 5. |  | A pin-jointed truss is attached to a vertical wall at points A, B, C and D. The members BE, BF, EF and AF are in the same horizontal plane. The truss supports vertically downward loads of 9kN and 6kN at E and F respectively and a horizontal load of 3kN at E in the direction EF. Calculate the forces in the members of the truss using tension coefficient method. | CO2 | 20 |
| **(OR)** | | | | |
| 6. |  | Using the method of Tension Coefficients, analyse the plane truss shown in figure below and find the forces in all members. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Analyse the continuous beam ABC shown in figure 7(a) by the flexibility method. EI is constant throughout. Draw the bending moment diagram. | CO3 | 20 |
| **(OR)** | | | | |
| 8. |  | Analyse the continuous beam using flexibility method. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Analyze the frame shown in Fig. 9(a) and draw the bending moment diagram using Stiffness method. Asume IAB = ICD = I and IBC = 2I. | CO4 | 20 |