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

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

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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 circular arch of span 16 m and rise 4 m is subjected to two point loads of 100kN and 80kN at the left and right quarter span points respectively. Find the reactions at the supports. Find also the bending moment, radial shear and normal thrust at 6 m from left support. | CO4 | 20 |
| (OR) | | | | |
| 2. |  | 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. | CO4 | 20 |
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| 3. | a. | Explain in detail the components of cables and their functions. | CO1 | 5 |
| b. | A cable of horizontal span 21m is to be used to support six equal loads of 40kN each at 3m spacing. The central dip of the cable is limited to 2m. Find the length of the cable required and also its cross sectional area if the safe tensile stress is 750 N/mm2. | CO3 | 15 |
| (OR) | | | | |
| 4. |  | A suspension bridge of 250m span has two nos. of three hinged stiffening girders supported by cables with a central dip of 25m. If 4 point loads of 300 kN each are placed at the centre line of the roadway at 20, 30, 40 and 50m from the left hand hinge, find the shear force and bending moment in each girder at 62.5m from each end. Calculate also the maximum tension in the cable. | CO3 | 20 |
|  |  |  |  |  |
| 5. |  | Using the method of tension coefficients, analyse the cantilever plane truss in figure and find the member forces.  5 kN  5 kN  2m  2m  3m  A  B  C  D  E | CO3 | 20 |
| (OR) | | | | |
| 6. |  | Analyze the Space truss shown in figure and determine the forces in the member of the truss.  space truss.jpg | CO3 | 20 |
|  |  |  |  |  |
| 7. |  | Analyse the continuous beam shown in fig below using stiffness method. | CO2, CO3 | 20 |
| (OR) | | | | |
| 8. |  | For the beam shown, use the stiffness method to: (i) Determine the deflection and rotation at B. (ii) Determine all the reactions at supports. (iii) Draw the quantitative shear and bending moment diagrams. | CO2, CO3 | 20 |
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|  | | **Compulsory**: |  |  |
| 9. |  | Analyse the continuous beam using flexibility method. | CO2, CO3 | 20 |