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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **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. |  | 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. | CO4 | 20 |
| (OR) | | | | |
| 2. |  | 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 |
| 3. |  | 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 |
| (OR) | | | | |
| 4. |  | 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 |
| 5. |  | Analyze the space truss shown in figure and determine the forces in the member of the truss.  space truss.jpg | CO4 | 20 |
| (OR) | | | | |
| 6. |  | 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. | CO4 | 20 |
| 7. |  | Analyse the continuous beam using flexibility method. | CO2 & CO3 | 20 |
| (OR) | | | | |
| 8. |  | Analyse the frame shown in figure by Flexibility method  force | CO2 & CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | For the beam shown, use the stiffness method to: (a) Determine the deflection and rotation at B. (b) Determine all the reactions at supports. (c) Draw the quantitative shear and bending moment diagrams. | CO2 & CO3 | 20 |

ALL THE BEST