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– 2017**

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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. | 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. | CO3 | 16 |
|  | b. | A parabolic 3 hinged arch of span ‘*l*’m is subjected to an UDL of *w* /m run over the entire section. Find the horizontal thrust at any section XX. | CO1 | 4 |
| (OR) | | | | |
| 2. | a. | 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. | CO3 | 16 |
|  | b. | Which of the two arches, viz. circular and parabolic is preferable to carry a uniformly distributed load? Why? | CO1 | 4 |
| 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. | CO3 | 20 |
| (OR) | | | | |
| 4. |  | The cables of a suspension bridge have a span of 60 m and a dip of 6 m. Each cable is stiffened by a girder hinged at the ends and at mid span to enable the cable to maintain its parabolic shape. There is a uniform dead load of 10 kN/m acting in the suspension bridge and live load of 40 kN/m over 10 m span moving in the stiffening girder. Determine the maximum cable tension when the head of the live load is on the central hinge. | CO3 | 20 |
| 5. |  | Analyse the continuous beam using flexibility method. | CO2, CO4 | 20 |
| (OR) | | | | |
| 6. |  | Analyse the frame shown in figure by Flexibility method  force | CO2, CO4 | 20 |
| 7. |  | Analyse the continuous beam using stiffness method.  Image result for analysis of continuous beam by stiffness method | CO2, CO4 | 20 |
| (OR) | | | | |
| 8. | a. | Explain the step by step procedure of the matrix stiffness method | CO1 | 14 |
|  | b. | Define i) Degree of freedom ii) Statical degree of indeterminacy | CO1 | 3 |
|  | c. | Why stiffness method has the name of Displacement method | CO1 | 3 |
|  | | **Compulsory:** |  |  |
| 9. |  | Analyze the Space truss shown in figure and determine the forces in the member of the truss.  space truss.jpg | CO3 | 20 |

ALL THE BEST