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 :** | **16AE2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AIRCRAFT STRUCTURES-I** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. |  | Questions | Course  Outcome | Marks |
| 1. |  | Find the forces in the members of truss shown in figure by method of joints. | CO2 | 20 |
| (OR) | | | | |
| 2. |  | A continuous beam, 12 m long simply supported over spans AB = BC = CD = 4 m, carries a uniformly distributed load of 3 kN/m run over span AB, a concentrated load of 4 kN at a distance of 1 m from support B on span BC and a load of 3 kN at the center of span CD. Using Clapeyron’s theorem, find support moments, reactions and Draw the bending moment and shear force diagram. | CO2 | 20 |
| 3. |  | A continuous beam ABC consists of two consecutive spans AB and BC 4 meters each and carries a distributed load of 60 kN/m. The A is fixed and the end B and C are simply supported. Using Moment distribution method, find support moments, reactions and Draw the bending moment and shear force diagram. | CO2 | 20 |
| (OR) | | | | |
| 4. |  | Derive the Euler’s crippling load for a column when it has (i) both ends hinged and (ii) one end fixed & other end free. | CO1 | 20 |
| 5. |  | In a material the principal stresses are 60 MN/m2, 48 MN/m2 and – 36 MN/m2.Calculate: i.Total strain energy. ii.Volumetric strain energy. iii. Shear strain energy. Factor of safety on the total strain energy criterion if the material yields at 120 MN/m2. Take E = 200 GPa and Poisson’s ratio = 0.3. | CO3 | 20 |
| (OR) | | | | |
| 6. |  | Derive an expression for bending stress in an unsymmetric section subjected to Mxand My with respect to principal axis andmodify this expression with respect to neutral axis. | CO2 | 20 |
| 7. |  | 1. Compute the load on the lumped flanges due to bending of the section shown in fig. Assume the web do not take part in bending. Compute the loads using moment values with respect to x and y axis and principal axis. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Derive the equation of motion and its solution for free vibration of an undamped translational system and free vibration of an undamped torsional system. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Briefly explain the different types of materialused in construction of theAircraft structures. | CO1 | 20 |

ALL THE BEST