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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**Supplementary Examination – June – 2017**

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|  |  |  | | | **2016-17 EVEN** |
| **Code :** | **14AE2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AIRCRAFT STRUCTURES** | **Max. marks :** | **100** |

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

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| **Q. No** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | The structure as shown in Figure is a Truss which is pinned to the floor at a point A and F. Determine the force to all members of the Truss. | CO2 | 20 |
| (OR) | | | | |
| 2. |  | A Pin-Jointed truss is shown in Figure. Determine the vertical displacement of joint E by using unit load method. All the members have cross sectional area of 250mm2 and same modulus of Elasticity 200Gpa | CO2 | 20 |
| 3. |  | Use Unit load Method to find the deflection at the center of the beam shown in Figure. Take E=200 GPa and I=400x106 mm4 | CO2 | 20 |
| (OR) | | | | |
| 4. |  | Using Castigliano’s Theorem determine the deflection at point D for the beam as shown in the Figure. Take E=200GPa and I=28.9x106mm4 | CO2 | 20 |
|  |  |
| 5. |  | **A** beam having the cross-section shown in Figure is subjected to a bending moment of 1500 N m in a vertical plane. Calculate the maximum direct stress due to bending stating the point at which it acts. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Determine the direct stress distribution in the thin-walled Z-section shown in Figure produced by a positive bending moment Mx*.* | CO2 | 20 |
| 7. |  | Calculate the shear flow distribution in the channel and the shear center distance from the web section as shown in Fig produced by a vertical shear load of 4.8 KN acting through its shear centre. Assume that the walls of the section are only effective in resisting shear stresses while the booms, each of area 300mm2, carry all the direct stress | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Auniform flat plate of thickness *t* has a width ***b*** in the y direction and length Iin the x direction see in Fig. The edges parallel to the ***x*** axis are clamped and those parallel to the *y* axis are simply supported. A uniform compressive stress (T is applied in the x direction along the edges parallel to the *y* axis. Using an energy method, find an approximate expression for the magnitude of the stress a which causes the plate to buckle, assuming that the deflected shape of the plate is given by. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | What are the application of composites in Aerospace Industry? | CO3 | 10 |
| b. | Briefly Explain Characteristic, Application and limitations of carbon Fiber reinforced Composites. | 10 |

ALL THE BEST