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



**End semester Examination– Nov / Dec – 2019**

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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.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Determine all member resultant force of the truss shown in fig.1 using method of joint.    Fig.1 | CO2 | 20 |
| **(OR)** | | | | |
| 2. |  | Determine all member resultant force of the truss shown in fig.2 using method of joint.  2  Fig.2 | CO2 | 20 |
| 3. |  | A simply supported beam ABC is continuous over two spans AB and BC of 6 m and 4 m respectively. The span BC carrying a uniformly distributed load of 1 kN/m and span AB carrying a point load of 3 kN is at a distance of 2 m from A. Find the support moment and the reactions using three moment equation. | CO2 | 20 |
| **(OR)** | | | | |
| 4. |  | A continuous beam ABCD is simply supported over three spans, such that AB= 8m, BC=12m and CD = 5m. It carries uniformly distributed load of 4 kN/m in span AB, 3 kN/m in span BC and 6 kN/m in span CD. Draw the shear force and bending moment diagram using moment distribution method. | CO2 | 20 |
|  |  |  |  |  |
| 5. |  | Derive the Euler’s equation for the Column with both ends hinged or pinned and one end fixed and other end free. | CO1 | 20 |
| **(OR)** | | | | |
| 6. | a. | Calculate the safe compressive load on a hollow cast iron column (one end fixed and other hinged) of 150 mm external diameter, 100 mm internal diameter and 10 m length. Use Euler’s formula with a factor of safety of 5 and E= 95 GN/m2. | CO1 | 10 |
| b. | Derive the Euler’s equation for the Column with both ends are fixed. | CO1 | 10 |
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| 7. |  | Brifly explain the different types of failure theories. | CO3 | 20 |
| **(OR)** | | | | |
| 8. |  | A blot is under an axial thrust of 9.6 kN together with a transverse force of 4.8 kN. Calculte its diameter according to:   1. Maximum Principal stress theory 2. Maximum shear stress theory 3. Strain energy theory   Given: Factor of safety = 3, Yield strength of material of bolt = 270 N/mm2, Poisson’s ratio = 0.3. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Briefly explain the different types of material used in Aircraft construction. | CO1 | 20 |