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

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**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **17AE2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INTRODUCTION TO AEROSPACE ENGINEERING** | **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. | Enumerate the works of Otto Lilienthal- the glider man. | CO1 | 10 |
| b. | Define standard atmosphere and explain the variation of temperature in earth’s atmosphere with a sketch. List the different layers of atmosphere. | CO1 | 10 |
| (OR) | | | | |
| 2 | a | Calculate the values of pressure, density and temperature for the standard atmosphere at an altitude of 12000 m. The standard sea level values are pressure = 101325 N/ m2, density = 1.2256 kg/m3 and temperature = 288.16 K. The temperature lapse rate  a = -0.0065 K/m | CO1 | 10 |
| b | Explain in detail the historical development of propulsion system  throughout the years. | CO1 | 10 |
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| 3. | a. | Discuss the classification of flight vehicles with neat sketches. | CO6 | 10 |
| b. | Describe the different parts of an aircraft and their functions. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | Write notes on airfoil nomenclature and NACA airfoil numbering system and define aerodynamic centre. | CO2 | 10 |
| b. | Briefly describe about three primary controls for an aircraft. | CO3 | 10 |
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| 5. | a. | Explain the construction of fuselage and functions of its components. | CO3 | 10 |
| b. | List the structural component of the aircraft wing and explain with neat sketch the functions associated with them. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Distinguish between the monocoque and semi monocoque structures. | CO3 | 10 |
| b. | Define sandwich structure and explain its advantages and disadvantages in aircraft structure. | CO3 | 10 |
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| 7. | a. | Describe the working of a jet engine. Depict the processes occurring in it on P-V and T-S diagrams. | CO4 | 15 |
| b | Distinguish between air breathing propulsion and rocket propulsion. | CO4 | 5 |
| (OR) | | | | |
| 8. |  | Consider a turbojet powered airplane flying at a standard altitude of 9150 m at a velocity of 800 km/h. The turbojet engine itself has inlet and exit areas of 0.63 and 0.40 m2 respectively. The velocity and pressure of the exhaust gas at the exit are 485 m/s and 0.28 bar respectively. Calculate the thrust of the turbojet. | CO4 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | List down the instruments used in the aircraft and explain the airspeed indicator with sketch. | CO5 | 10 |
| b. | Explain about the construction, operation, merits and demerits of liquid propellant rockets. | CO6 | 10 |