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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14AE2001** | **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. | Differentiate “ Airmen approach and Chauffeurs approach”. | CO1 | 5 |
| b. | Enumerate the works of Otto Lilienthal- the glider man. | CO1 | 15 |
| (OR) | | | | |
| 2 |  | Calculate the values of pressure, density and temperature for the standard atmosphere at an altitude of 15000 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 | 20 |
|  |  |  |  |  |
| 3. | a. | Explain the theories of lift generation. | CO1 | 10 |
| b. | Describe the different parts of an aircraft and their functions. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the classification aircraft according to the wing, landing gear, and engine with figure. | CO2 | 10 |
| b. | Briefly describe about three primary controls for an aircraft. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | Explain about the various materials used for aircraft construction. | CO2 | 10 |
| b. | List the structural component of the aircraft wing and explain with neat sketch the functions associated with them. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Distinguish between the monocoque and semi monocoque structures. | CO2 | 10 |
| b. | Explain with a neat sketch the different types of fuselage construction. | CO2 | 10 |
|  |  |  |  |  |
| 7. |  | Describe the working of a jet engine. Depict the processes occurring in it on P-V diagram. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Consider a turbojet powered airplane flying at a standard altitude of 12000 m at a velocity of 650 km/h. The turbojet engine itself has inlet and exit areas of 0.50 and 0.42 m2 respectively. The velocity and pressure of the exhaust gas at the exit are 460 m/s and 0.25 bar respectively. Calculate the thrust of the turbojet. The standard sea level values are pressure = 101325 N/ m2, density = 1.2256 kg/m3 and temperature = 288.16 K, lapse rate = -0.0065 K/m. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a.. | Discuss the working principle of rocket with neat sketch. Derive the expression for specific impulse (Isp) for a rocket engine in terms of the temperature of combustion chamber (To) and the molecular weight of the propellant. | CO2 | 10 |
|  | b. | Explain the types of rockets and their applications. | CO2 | 10 |