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



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

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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. | Draw six planforms of Aeroplane Wings. | CO1 | 4 |
| b. | Derive the relationship between Geometric and Geopotential Altitudes. | CO1 | 6 |
| c. | Derive the Hydrostatic equation of the Standard Atmosphere. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | State and explain the six different altitudes. | CO1 | 6 |
| b. | Write the life history of Wright Brothers. | CO1 | 7 |
| c. | State the contributions of Sir George Cayley and Otto Lilienthal in Aeronautical Engineering. | CO1 | 7 |
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| 3. | a. | State any four Flap systems, illustrate them with figures and describe them in detail. | CO2 | 10 |
| b. | Describe the lift generation process of an aerofoil with illustration. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | State the classification of chemical rocket propulsion. | CO4 | 4 |
| b. | Compare the Gas Turbine Engine with Ram Jet and Scram Jet Engine in detail by drawing a schematic diagram. Describe each parts of the engine. | CO4 | 16 |
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| 5. | a. | State the materials used for aircraft fabrication and describe them in detail. | CO3 | 6 |
| b. | Write in detail three main groups of composite materials. | CO3 | 8 |
| c. | State the basic requirement of aircraft materials. | CO3 | 6 |
| **(OR)** | | | | |
| 6. | a. | Derive Bernoulli’s equation. | CO2 | 14 |
| b. | An aeroplane is flying with velocity of 60 m/s at an altitude at which the pressure is 70101 Pa and the density is 0.09093 kg/m3. At a point on the wing, airflow velocity is 70m/s. Calculate the pressure at this point. Assume the flow is incompressible. | CO2 | 6 |
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| 7. | a. | Derive the thrust equation for jet propulsion and deduce it for rocket propulsion. | CO4 | 10 |
| b. | Derive an expression for nozzle exit velocity of rocket motor. | CO4 | 6 |
| c. | Define specific impulse and obtain an expression for specific impulse. | CO4 | 4 |
| **(OR)** | | | | |
| 8. |  | Write a detailed essay on Aircraft Instruments. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Describe isentropic flow and derive the isentropic flow relations. | CO2 | 10 |
| b. | Derive the energy equation for compressible fluid flows. | CO2 | 10 |