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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**Make-Up Examinations, July 2024**

**Course Code**: MEC2005

**Course Name**: Fundamentals of Aerospace Engineering

**Program:** B. Tech

**Date**: 19/JULY/2024

**Time**: 1:30 PM – 4:30 PM

**Max Marks**: 100

**Weightage**: 50 %

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*
3. *Assume any missing data*

**Part A**

**Answer all the Questions. Each question carries TWO marks. (5Qx 02M= 10M)**

**Q.NO.1** The angle between chord and relative wind is known as \_\_\_\_\_\_ [2M]

(C.O.No.1) [Application]

**Q.NO.** When the mass entering and mass leaving a system is same, we can say that the mass is conserved. State if this statement is TRUE/FALSE. (C.O.No.2) [Application]

**Q.NO.3** Absolute altitude is the sum of \_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_. [2M] (C.O.No.1) [[Knowledge

**Q.NO.4** Velocity is a scalar quantity. State if this statement is TRUE/FALSE

(C.O.No.3) [[Knowledge]

**Q.NO.5** Difference between absolute altitude and geometric altitude is \_\_\_\_\_\_\_\_. [2M]

(C.O.No.1) [[Knowledge]

**Part B**

**Answer all the Questions. Each question carries FIFTEEN marks. (4Qx15M=60M)**

**Q.NO. 6.** An airplane consists of different control surfaces so as to fly it in a controlled condition. Name all the control surfaces that can be found on a regular airplane and also describe the components of an airplane. (C.O.No.2) [Comprehension]

**Q.NO. 7.** Explain the working principle of a propeller with proper diagrams. [15M] (C.O.No.4) [Comprehension]

**Q.NO. 8.** Draw and explain airfoil terminology. (C.O.No.3) [Comprehension]

**Q.NO. 9** Explain Kepler’s laws of planetary motion with proper diagrams. [15M] (C.O.No.2) [Comprehension]

**Part C**

**Answer all the Questions. (1Qx10M +1Qx20M =30M)**

**Q.NO. 10.** An engineer wants to use *NACA –4315* profile to build a RC plane. By some analysis, he came to a conclusion that he is going for chord length of 82cm. Determine (in mm):  
 i) Maximum camber

ii)Distance of maximum camber from leading edge.

iii)Maximum thickness [10M] (C.O.No.2) [Comprehension]

**Q.NO. 11**. An aneroid barometer in an Airbus A-380 cursing at a geometric altitude of 14km displays the static pressure of air outside to be 1.41x104 Pa. Determine the error in this reading as per the standard atmosphere model. Also, determine density and temperature of air at the same geometric height. [Radius of earth = 6357km, Rair = 287 J/Kg.K, Density of air at sea level is 1.225 kg/m3, Temperature and pressure at sea level are 288.16K and 101.325 kPa ]

[20M] (C.O.No.1) [Application]