Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

III SEMESTER B.TECH. (AERONAUTICAL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2018

SUBJECT: INTRODUCTION TO AEROSPACE ENGINEERING

[AAE 2103]

REVISED CREDIT SYSTEM
(29/12/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	Analyze the importance of understanding standard atmosphere in aeronautics.	**2**
1B.	Analyze the relation between geopotential and geometric altitudes.	**3**
1C.	Define the terms fluid element, stream lines and stream tube in detail with necessary diagrams.	**5**
2A.	Examine the working principle behind subsonic wind tunnels	**2**
2B.	Derive continuity equation from fundamentals	**3**
2C.	In a low-speed subsonic wind tunnel with a closed test section, a static pressure tube on the wall of the tunnel test section measures 2074 lb/ft^2. The temperature of the air in the test section is 540^{0}R. A Pitot tube is inserted in the middle of the flow in the test section in order to measure the flow velocity. The pressure measured by the Pitot tube is 2200 lb/ft^2. Calculate the flow velocity in the test section in miles per hour(mph). The value of gas constant (R) is 1716.	**5**
3A.	Explain the various terminologies used in airfoil nomenclature with proper diagram.	**2**
3B.	Explain drag divergence Mach number in detail with necessary diagrams.	**3**
3C.	Explain the term pressure co-efficient. Also analyze the procedure to obtain lift co-efficient from it.	**5**

4A.	Define the term neutral point with necessary diagrams.	**2**
4B.	Examine the need for fly by wire aircraft control systems.	**3**
4C.	Explain lateral static stability with all necessary diagrams.	**5**
5A.	Classify the various jet propulsion technologies available for aircrafts.	**2**
5B.	State and comment on Kepler's laws of motion with suitable diagrams and equations.	**3**
5C.	Explain impulsive transfer process in detail with all necessary diagrams and equations.	**5**