

MANIPAL INSTITUTE OF TECHNOLOGY

III SEMESTER B.TECH. (AERONAUCAL ENGINEERING) END SEMESTER EXAMINATIONS, NOV/DEC 2017

SUBJECT: INRODUCTION TO AEROSPACE ENGINEERING [AAE 2103]

REVISED CREDIT SYSTEM (28/12/2017)

Time: 3 Hours

ent Institution of Manipal University

MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Explain the theory behind the working of propellers in aircrafts.	(02)
1B.	Derive hydrostatic equation from fundamentals.	(03)
1 C .	Explain bi-elliptical transfer with necessary diagrams and equations.	(05)
2A.	Explain boundary layer with all necessary diagrams and equations.	(02)
2B.	Derive Euler's equation from fundamentals.	(03)
2C.	Explain pitot static systems.	(05)
3A.	Explain various terminologies used in airfoil nomenclature with the help of diagrams. Also explain various airfoil types.	(02)
3B.	What do you mean by compressibility corrections? Explain with proper diagrams and equations.	(03)
3C.	Explain why swept wings are preferred for high speed aircrafts. Give necessary diagrams and equations	(05)
4A.	Explain range and endurance for both propeller and jet powered aircrafts with all necessary equations.	(02)
4B.	Explain the terms thrust required and thrust available with proper diagrams and equations for both propeller and jet powered aircrafts	(03)
4C.	What is zero lift drag? Also Prove that zero lift drag is equal to drag due to lift at minimum thrust required	(05)

- **5A.** Explain mechanical flight control systems. What are its advantages and (02) disadvantages?
- **5B.** Explain the terms static and dynamic stability using proper diagrams. (03)
- **5C.** What do you mean by longitudinal static stability for an aircraft? Also explain neutral (05) point.