

(Following Paper ID and Roll No. to be filled in your  
Answer Books)

**Paper ID : 148851**

Roll No. 

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**B. TECH.**

**Theory Examination (Semester-VIII) 2015-16**

**AERODYNAMICS DESIGN & TESTING**

***Time : 3 Hours***

***Max. Marks : 100***

**Section-A**

- 1. Attempt all parts. All parts carry equal marks. Write answers of each part in short maximum 30 words.**

**(10×2 = 20)**

- (a) Define Taper Ratio.
- (b) Define Total Drag.
- (c) What is Reynold's No.
- (d) What is Mach No.
- (e) What are Drop Tests?
- (f) Define gust.
- (g) What do you understand by "pay load".

- (h) What is service ceiling?
- (i) What are fixed equipments?
- (j) What do you mean by Interference Drags?

### **Section-B**

**2. Attempt any five questions from this part. ( $5 \times 10 = 50$ )**

- (a) Briefly explain the historical development of airplanes.
- (b) Discuss special features of supersonic airplanes.
- (c) Explain the method of selection of optimum wing loading and thrust/power loading based on landing speed.
- (d) Explain the method of estimation of parasite drag of different components of airplane.
- (e) Describe the function and uses of fixed and variable pitch propeller.
- (f) What are the various aerodynamic consideration of an airplane.
- (g) Describe the various types of landing gears used on an airplane.
- (h) What are the basic principles of flight testing and performance reduction.

## Section-C

**Note: Answer any two questions from this part. (2×15=30)**

3. Describe the weight estimation method and show overall weight to payload ratio ( $W_o/W_p$ ) and full weight to overall weight ratio ( $w_f/w_o$ ).
4. Describe the various types of wind tunnels.
5. Write short notes on any three of the following.
  - (i) V-n diagram.
  - (ii) Static stability and static margin.
  - (iii) Take off and landing distances.
  - (iv) Aerodynamic testing facilities.
  - (v) Turbo prop and Jet Engines.