

JAYA GROUP OF INSTITUTIONS-THIRUNINRAVUR  
6<sup>th</sup> SEM – B.E. / B.Tech  
INTERNAL ASSESSMENT-II(MODEL EXAM-II)

Sub. Name: Wind Tunnel Techniques  
Sub. Code: AE 2353  
Duration: 180 minutes

Date: 11-03-2015  
Branch: Aeronautical  
Max.Marks: 100

**PART-A (10 x 2 = 20)**

1. Define Doppler shift.
2. Distinguish intrusive and non-intrusive flow diagnostics method?
3. What is laser? Explain its working.
4. Write any four application of LDA.
5. What do you mean by the term 'seeding'.
6. What is a wind tunnel?
7. Define Reynolds's Number.
8. Distinguish a model and a prototype.
9. Define similitude
10. What are the components of a subsonic wind tunnel?

**PART-B (5 x 16 = 80)**

- 11.a) Explain laser Doppler velocimetry with neat sketches.

(OR)

b) Briefly discuss about Doppler shift and explain about the instrument which works on the Doppler shift principle

- 12.a) Discuss about particle Image velocimetry with neat sketches.

(OR)

b) Explain any two Non-intrusive flow diagnosis techniques

- 13.a) How do you measure temperature in a turbulent flow using laser induced fluorescence techniques.

(OR)

b) Thrust developed by propeller assumed that 't' depends upon angular velocity 'w' and velocity 'v', dynamic viscosity, diameter, mass flow density and speed of sound in medium C using Buckingham's theorem.

14.a) i) Write down the classification of wind tunnel.

ii) Explain about the types of similarities.

(OR)

b) Discuss about the design parameters of a subsonic wind tunnel.

15.a) Discuss in detail about the open circuit subsonic wind tunnel with neat layout. Mention its advantages and dis-advantages.

(OR)

b) i) Discuss in detail about closed type single return wind tunnel with neat sketch.

ii) What are non-dimensional numbers? Write about any five non-dimensional number.

Aeronautical

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Model II