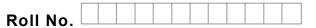


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Total No. of Pages : 02

Total No. of Questions : 09

# B.Tech.(ANE) (Sem.-6) WIND TUNNEL TECHNIQUES Subject Code : ANE-326 Paper ID : [A1232]

## Time: 3 Hrs.

Max. Marks: 60

## **INSTRUCTION TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks 1. each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students 3. have to attempt any TWO questions.

## **SECTION-A**

- istRanker.on Q1 Define & explain the importance of following :
  - a) Reynolds' Number.
  - b) Froude Number.
  - e) Buoyancy correction.
  - d) Wake blockage.
  - e) Diffuser section of wind tunnel.
  - f) Energy ratio.
  - g) Force balance.
  - h) Test section flow quality.
  - i) List various flow visualization techniques.
  - j) Calibration of wind tunnel.

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#### **SECTION-B**

- Q2 Explain 'Laser-Doppler anemometry'.
- Q3 Write a note on 'Particle image velocimetry'.
- Q4 Define and explain the usage of hot-wire anemometer.
- Q5 Explain briefly the optical methods of flow visualization.
- Q6 Distinguish between supersonic and hypersonic wind tunnels.

#### **SECTION-C**

- Q7 Distinguish between internal & external wind tunnel balances. Discuss the utility of three degree of freedom and six degree of freedom balances. (4,6)
- Q8 Sketch a subsonic open circuit wind tunnel. What parameters are considered during the design of a subsonic open circuit wind tunnel? Explain the process for measurement of pressure and velocity in subsonic open circuit wind tunnel. (3,3,4)
- Q9 Write notes on the following (**Any two**) :

a) Dye injection special techniques

- b) Transonic tunnels
- c) Non-dimensional numbers & their importance

(2×5)