



CBCS SCHEME

15AE752

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Wind Tunnel Techniques

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Outline the Buckingham's theorem application. (08 Marks)
b. Derive the expression for the following using force ratio. (08 Marks)
i) Reynold's number
ii) Froude number
iii) Euler's number
iv) Mach number.

OR

- 2 a. Explain the different types of similarities. (08 Marks)
b. Discuss about scale effects similarities. (08 Marks)

Module-2

- 3 a. Draw and explain the principle, operation and parts of closed circuit low speed subsonic wind tunnel. (10 Marks)
b. Compare the advantages and disadvantages of open and closed circuit wind tunnel. (06 Marks)

OR

- 4 a. Explain about flow irregularity in subsonic wind tunnel. (08 Marks)
b. Discuss about special purpose wind tunnels and write its uses. (08 Marks)

Module-3

- 5 a. Discuss about need for calibration and points to check for subsonic wind tunnel calibration. (08 Marks)
b. Explain about the following with neat sketch : (08 Marks)
i) Pressure sphere
ii) Turbulence sphere.

OR

- 6 a. Explain the construction of Six component wind tunnel balance with neat sketch. (10 Marks)
b. Write about working principle and applications of Hot wire anemometer. (06 Marks)

Module-4

- 7 a. Explain the various types of pressure measurement techniques used in wind tunnel. (10 Marks)
b. Explain about flow visualization techniques used for low speed subsonic flows. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain the working of pitot – static tube with neat sketch and discuss how it measures velocity in a flow. (08 Marks)
- b. Draw and explain the principles and working of Mach – Zehnder interferometer. (08 Marks)

Module-5

- 9 a. Write short notes on :
- i) Intake test (10 Marks)
- ii) Stagnation point (06 Marks)
- b. Explain about Convergent-Divergent nozzle and its operation with sketch. (06 Marks)

OR

- 10 a. Write the expression for Taylor – Proudman theorem with an example and its applications. (08 Marks)
- b. Explain Flush – mounted pressure transducers with neat sketch. (08 Marks)

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