

**Seventh Semester B.E./B.Tech. Degree Examination, June/July 2025**  
**Basics of Flight Simulation**

Time: 3 hrs.

Max. Marks: 100

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

**Module-1**

- 1 a. Write a note on training transfer and define the measures of training transfer equations. (10 Marks)
- b. Explain advances of the microelectronics Revolution in Moore's law. (10 Marks)

**OR**

- 2 a. Explain how an engineering flight simulator differs from training simulator. (10 Marks)
- b. With the help of a case study flight for simulation. Explain how aviation is under pinned by safety. (10 Marks)

**Module-2**

- 3 a. Draw a flow charts for organization of a flight simulator to overview of flight simulation technique and with the help of flow chart. Explain equation of motion and Aerodynamic model. (10 Marks)
- b. Explain the following : (10 Marks)
  - i) Gear model
  - ii) Weather model.

**OR**

- 4 a. With the help of berspul overview of flight simulation techniques. Explain the engine model and Data Acquisition model. (10 Marks)
- b. Write a note on following : (10 Marks)
  - i) Scheduled and unscheduled maintenance
  - ii) Sounds are provided in a simulator to increase fidelity.

**Module-3**

- 5 a. With the help of Euler's method, explain the first order methods. (10 Marks)
- b. Derive the equation using Newtonian mechanics theory for the cannonball is fired horizontally at 500 m/s from a cliff 100 m above the sea level. How fear from the cliff will the cannonball impact the sea and how long will it take before it splashes into the sea. (10 Marks)

**OR**

- 6 a. With the help of graph, explain the flight data. (10 Marks)
- b. Compute Differential equations. (10 Marks)

**Module-4**

- 7 a. With the help of NACA6409 airfoil profile, explain the Aerodynamic lift. Show case the increment of lift by drawing lift curve characteristics. (10 Marks)
- b. With neat sketch of aircraft body axes, explain the body frame. (10 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. Derive Quaternion's equations. (10 Marks)  
b. Write a note on thrust produce from the jet engine. (10 Marks)

Module-5

- 9 a. Describe instrument landing system. (10 Marks)  
b. Explain why trimming is also important in flight simulation. (10 Marks)

OR

- 10 Explain the following simulation of EFIs display  
i) Attitude indicator  
ii) Altimeter  
iii) Airspeed indicator  
iv) Compass card

(20 Marks)

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