

# CBCS SCHEME

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15AE63

## Sixth Semester B.E. Degree Examination, Jan./Feb. 2021 Aircraft Performance

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 Consider an airplane at steady, level and unaccelerated flight for an above said condition, show that  $\left[ \frac{L}{D} \right]_{\max} = \frac{1}{\sqrt{4CD_0K}}$ . (16 Marks)

OR

- 2 Discuss the effect of altitude on Thrust required and power required curves. (16 Marks)

### Module-2

- 3 Represent the forces on the airplane in steady climb and derive the expression for rate of climb in terms of T/W, W/s and density and explain the climb performance of an airplane with aid of hodograph diagram. (16 Marks)

OR

- 4 a. Briefly explain the following terms with relevant graph :  
i) Absolute ceiling      ii) Service ceiling. (08 Marks)  
b. Define Gliding flight and Derive an expression for minimum glide angle. (08 Marks)

### Module-3

- 5 Derive the Range and Endurance equation for Jet Engine Aircraft. (16 Marks)

OR

- 6 Derive the Range and Endurance equation for Piston Engine Aircraft. (16 Marks)

### Module-4

- 7 Explain briefly about the various phases of Take – off of an Airplane with neat sketch. (16 Marks)

OR

- 8 Derive an expression for ground roll distance during Take – off and landing. (16 Marks)

### Module-5

- 9 Draw a V – n diagram for a typical Jet trainer Aircraft and briefly explain the salient parameters. (16 Marks)

OR

- 10 With a neat sketch, explain the pull - up, pull – down and level turn maneuvers and derive an expression of minimum Turn radius and maximum Turn rate. (16 Marks)

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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.