

CBCS SCHEME

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17AE32

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Elements of Aeronautics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain with neat sketch Aircraft Axis system. (10 Marks)
b. Derive and describe the hydrostatic equation and also state the relation between geo-potential and geometric attitude. (10 Marks)

OR

- 2 a. Describe about Typical Wing and fuselage structure with neat diagrams. (10 Marks)
b. Discuss about the metallic and non-metallic materials for aircraft. (10 Marks)

Module-2

- 3 a. Define speed of sound and prove that $a = \sqrt{\gamma RT}$ (10 Marks)
b. Explain Bernoulli's theorem and prove that $P_1 + \frac{1}{2}\rho_1 V_1^2 = P_2 + \frac{1}{2}\rho_2 V_2^2$ (10 Marks)

OR

- 4 a. Explain with neat sketches factors affecting Lift and Drag. (12 Marks)
b. A jet plane which weighs 29430N and has a wing area of 20m² flies, at a velocity of 250km/hour. When the engine delivers 7357.5kW. 65% of the power is used to overcome the drag resistance of the wing. Calculate the coefficient of lift and coefficient of drag wing. Take density of air equals to 1.21 kg/m³. (08 Marks)

Module-3

- 5 a. Describe principle of operation of Turbo jet engine with neat diagram. (10 Marks)
b. Compare Advantages and Disadvantages of Turbojet, Turboprop and Turbofan engine. (10 Marks)

OR

- 6 a. Discuss about the performance characteristic of Turbojet, Turboprop and Turbofan engine. (09 Marks)
b. Give explanation about Ramjet and Thrust augmentation with neat diagram. (11 Marks)

Module-4

- 7 a. With suitable diagrams describe details about static and Dynamic stability. (10 Marks)
b. Describe in details with suitable diagrams Longitudinal stability and Lateral stability. (10 Marks)

OR

- 8 a. Explain : i) Landing ii) Gliding, of aircraft with neat sketches. (14 Marks)
b. Give details about aerobatics. (06 Marks)

Module-5

- 9 a. What are the pneumatic system components discuss in details. (10 Marks)
b. Discuss about closed centre hydraulic system in details with neat diagram. (10 Marks)

OR

- 10 a. What are the basic methods of cooling the cabin air, describe in details with neat diagrams. (10 Marks)
b. Explain in details with neat diagrams about :
i) Magnetic Compass ii) Tachometer. (10 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.