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 $20m^2$ 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/m^3. **(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) Glading, 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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