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18AE34

## Third Semester B.E. Degree Examination, July/August 2021 Elements of Aeronautics

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1 a. Explain with neat sketch monocoque, semi monocoque and Truss structures of Aircraft. (10 Marks)  
 b. Explain in detail with application metallic and non metallic materials used in aircrafts. (10 Marks)
- 2 a. Explain with neat sketch, the principle operation of Helicopter and their functions. (12 Marks)  
 b. Explain with neat sketches the high lift devices. (08 Marks)
- 3 a. Write in detail about the aerofoil nomenclature with sketches. (10 Marks)  
 b. Explain about i) Aerodynamic centre ii) Centre of pressure. (10 Marks)
- 4 a. Explain how does a pressure distribution over a wing section occur. (10 Marks)  
 b. Discuss : i) Aspect ratio ii) Mach number iii) Supersonic flight effects (10 Marks)
- 5 a. What is aircraft power plant? Write the classification of aircraft power plant in brief. (08 Marks)  
 b. With a neat sketch, explain 'Turbo Fan' Engine and explain about Bypass ratio and its significance. (12 Marks)
- 6 a. With a neat sketch, explain Brayton cycle and its application in jet engines. (10 Marks)  
 b. What is thrust Augmentation? Explain different thrust Augmentation method. (10 Marks)
- 7 a. With a neat sketch, explain conditions of static and dynamic stability of an aircraft. (10 Marks)  
 b. With a neat sketch, explain contribution of control surfaces in maintaining aircraft stability and control. (10 Marks)
- 8 a. Explain with a characteristics chart effect of power and attitude on performance of the aircraft. (10 Marks)  
 b. Explain with neat sketch inverted maneuvers of aircraft. (10 Marks)
- 9 a. With the help of block diagram, explain aircraft electrical generation and distribution system. (10 Marks)  
 b. Explain aircraft navigation system. List the components which guide the aircraft during flight. (10 Marks)
- 10 a. Draw the neat block diagram of aircraft pneumatic system and explain it. (10 Marks)  
 b. Write a short notes on : (10 Marks)  
     i) Aircraft oxygen system      ii) Environmental control system.

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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.