



**B.E DEGREE EXAMINATIONS: DEC 2014**

**(Regulation 2013)**

Second Semester

**AERONAUTICAL ENGINEERING**

U13AET201: Elements of Aeronautics

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. On an unsymmetrical airfoil, in what direction does the center of pressure move when the angle of attack changes
  - a) Forward only
  - b) Rearward only
  - c) Fore and aft
  - d) No change
2. Movement of an aircraft about its lateral axis is called \_\_\_\_\_
3. If the altitude is measured with reference to centre of the earth, then it is called
  - a) Geopotential altitude
  - b) Pressure altitude
  - c) Geometric altitude
  - d) Absolute altitude
4. In the Atmosphere, the boundary between stratosphere and mesosphere is called \_\_\_\_\_
5. What type of skin construction can withstand considerable damage and still hold together?
  - a) Semi monocoque
  - b) Monocoque
  - c) Plastic-impregnated
  - d) Wood-impregnated
6. In the monocoque design, the main stress on an airplane is carried by what structural unit(s)?  
\_\_\_\_\_
7. Which one of the following belongs to thermal environment in space?
  - a) Io
  - b) Solar radiation
  - c) Neutral gas part

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Centre of pressure and Aerodynamic centre.

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14. Explain the term 'Empenage'.

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15. How is thrust generated in jet

propelled aircraft?  
 16. What is the basic operating principle of a piston engine?  
 17. Dist

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23. a) (i) With a neat sketch explain the principle of operation of a turbofan engine. (10)  
(ii) Explain the use of thrust augmentation (4)  
(OR)
- b) (i) Briefly describe the Propeller-Propulsion System. (6)  
(ii) Derive the Froude's efficiency of propulsive system from momentum theory of propulsion. (8)
24. a) (i) Explain the Monocoque and Semi-monocoque construction with neat sketches (8)  
(ii) Explain the use of titanium and composite materials in aerospace industry (6)  
(OR)
- b) (i) With neat sketch, explain the construction of a typical aircraft wing. Show all the structural components of wing construction and mention the types of loads/stresses experienced by the structural members. (10)  
(ii) Briefly discuss on Flight loads (4)
25. a) (i) Briefly describe the space environment and space debris (6)  
(ii) Explain working principle of Rockets, Ramjet and Scramjet (8)

**(OR)**

- b) (i) Explain the thrust vector control mechanisms and Aerodynamic Decelerators in Re-entry vehicles (8)
- (ii) Explain the Kepler's laws of planetary motion (6)

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