

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech., Summer 2017 - 18 Examination**

**Semester: 3**  
**Subject Code: 03101201**  
**Subject Name: Elements of Aeronautics**

**Date: 09/06/2018**  
**Time: 02:00 pm to 04:30 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

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**Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)**

1. What word describes a force that slows an object when air pushes against it?  
(a) Drag, (b) Downforce, (c) Drafting, (d) Deceleration
2. What is aerodynamics?
3. In NACA 23012, Where is the maximum camber is located?
4. What are the four principles of flight?
5. What are the four typical loads on an aircraft?  
(a) Tension, torsion, creep, elongation, (b) Elasticity, shear, compression, torsion,  
(c) Tension, compression, torsion, shear, (d) Compression, buckling, elasticity, shear
6. What is the function of ribs in aircraft?
7. Define Chord line in airfoil.
8. What is the function of tail planes?
9. What is propulsion unit?
10. What is a propulsion system?
11. Define Air Traffic Control.
12. How Air Traffic Flow Management is work?
13. What is a Balance force?
14. DME is usually used in conjunction with:  
(a) ADF, (b) ILS, (c) VOR, (d) CCO
15. How is the Variable Frequency of VOR modulated?  
(a) Frequency Modulated, (b) Phase Modulated, (c) Amplitude Modulated, (d) No one

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**Q.2 Answer the following questions. (Attempt any three) (15)**

- A) With help of neat sketch explain airfoil nomenclature.
- B) Explain three types of aircraft structures with neat sketch.
- C) Explain "Turbo Fan Engine" with neat sketch.
- D) Explain "Radio Transmitter" with block diagram.

**Q.3 A)** Explain working principle of pitot tube and pitot static tube with help of suitable diagram. (07)

**B)** Define “Standard Atmospheric conditions”. Explain “Temperature variation” with altitude with graph Temp vs. Altitude. Define “Iso-Thermal Layer”. (08)

**OR**

**B)** What are the different types of altitudes in ISA? Briefly explain pressure, temperature and density altitudes. (08)

**Q.4 A)** With help of sketch explain about monocoque and semi-monocoque constructions. (07)

**OR**

**A)** Explain main components of truss type fuselage structure with neat sketch. (07)

**B)** With help of neat sketch explain working of Turbo-jet engine. (08)