

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2019-20 Examination

Semester: 5
Subject Code: 03101346
Subject Name: Basic Aircraft Science

Date: 28/11/2019
Time: 10:30am to 01:00pm
Total Marks: 60

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.

Q.1 Objective Type Questions -**15**

1. When the pressure is half of that at sea level, what is the altitude?
 - A) 12,000 ft.
 - B) 18,000 ft.
 - C) 8,000 ft.
 - D) 10,000 ft
2. Which statement is correct regarding the aerodynamic centre
 - a) $dC_m / dC_L = 0$
 - b) $dC_m / dC_L > 0$
 - c) $dC_m / dC_L < 0$
 - d) None of the above
3. 1 atmospheric pressure at mean sea level is equal to
 - a) 0.5 bar
 - b) 2 bar
 - c) 1.01325 bar
 - d) all the above
4. A barometer indicates
 - A) Pressure
 - B) Temperature
 - C) Density
 - D) Velocity
5. The _____ give the wing its cambered shape and transmit the load from the skin and stringers to the spars
6. _____ Decreases lift, Can augment aileron function
7. Load factor in Vertical climbing is _____
8. Load factor is defined by an expression _____
9. The center of pressure pressure is a point on the chord line of an airfoil at which the pitching moment coefficient is _____
10. The lapse rate in Troposphere of the Atmosphere is _____
11. The lapse rate in stratosphere is _____
12. What is steady level flight _____
13. In turning flight the load factor is _____
14. The propulsive power developed by the turbojet engine is given by _____
15. In Troposphere the temperature at an altitude of 11km (at tropopause) is _____

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

- A) Define drag force and explain different kinds of drag forces on the aircraft
- B) Explain different Types of Airspeeds
- C) Derive polytropic efficiency $P = 2 / (1 +)$ where $= (v_i / v_e)$
- D) Explain Airfoil Nomenclature

Q.3 (A) Explain the working principle of Ramjet Engine with its Application, Advantage & Disadvantage**07**

- B) Describe the aileron balance panel and linkage uses varying air pressure to assist in control surface positioning

08**OR**

- B) Explain the Altitude Indicator Operation

08**Q.4 A) Explain Gyroscope working principle and applications****07****OR**

- A) Explain Radar and Types of radar with block diagram

07

- B) Explain any six primary flight instruments placed in Aircraft Cockpit with indicators

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