

Flight Mechanics

HAL Exam.

P1.) What is the ratio of density at 4 km and sea level if velocity of aircraft at 4 km is V and the equivalent speed is half of V ?

A.) 4

B.) 0.25

C.) 0.5

D.) 2

P2.) While going from sea level to 10 km of altitude, the lapse rate "a" for the temperature variation satisfies:

A.) $a < 0$

B.) $a > 0$

C.) $a = 0$

D.) $a \rightarrow \infty$

P3.) Drag polar of an aircraft is $C_D = C_{D_0} + K C_L^2$. During cruise, the lift coefficient for minimum thrust required is equal to

A.) $\sqrt{\frac{3C_{D_0}}{K}}$

B.) $\sqrt{\frac{C_{D_0}}{3K}}$

C.) $\sqrt{\frac{C_{D_0}}{6K}}$

D.) $\sqrt{\frac{C_{D_0}}{K}}$

P4.) Consider a glider with wing span b in an unaccelerated flight. If span b is increased keeping the chord length fixed (for a rectangular wing), then velocity for cruise flight

A.) increases

B.) decreases.

C.) Remains unchanged

D.) None of the above.

P5.) For an aircraft in a cruise condition, if C_D is the drag coefficient and C_{D_0} is the parasite drag coefficient, then the ratio $\frac{C_D}{C_{D_0}}$ for minimum thrust required is equal to

A.) 4

B.) 0.66

C.) 0.5

D.) 2

P6.) For a very large load factor n , the radius of turn while doing a pull-up, Pull-down and Turn maneuver is related to n as

A.) $R \propto \sqrt{n}$

B.) $R \propto n$

C.) $R \propto \frac{1}{\sqrt{n}}$

D.) $R \propto \frac{1}{n}$