ASSIGNMENT 17

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I. GATE 4

1) Which of the following design parameters influence the maximum rate-of-climb for a jet-propelled airplane?
   - Wing loading
   - Maximum thrust-to-weight ratio
   - Zero-lift drag coefficient
   - Maximum lift-to-drag ratio

   a) P and Q alone
   b) P, Q, R, and S
   c) P, Q, and S alone
   d) Q, R, and S alone

2) Consider the following four statements regarding aircraft longitudinal stability:
   - $C_{M,cg}$ at zero lift must be positive
   - $\frac{\partial C_{M,cg}}{\partial \alpha_a}$ must be negative :α_a is absolute angle of attack
   - $C_{M,cg}$ at zero lift must be negative
   - Slope of C_L versus α_a must be negative

   Which of the following combination is the necessary criterion for stick fixed longitudinal balance and static stability?

   a) Q and R only
   b) Q, R, and S only
   c) P and Q only
   d) Q and S only

3) Data for a light, single-engine, propeller-driven aircraft in steady level flight at sea level is as follows: velocity $V_\infty = 40\ \frac{m}{s}$, weight $W = 13000\,\text{N}$, lift coefficient $C_L = 0.65$, drag coefficient $C_D = 0.025 + 0.04C_L^2$, and power available $P_{av} = 100,000\ \frac{J}{s}$. The rate of climb possible for this aircraft under the given conditions is

   a) 7.20
   b) 5.11
   c) 6.32
   d) 4.23