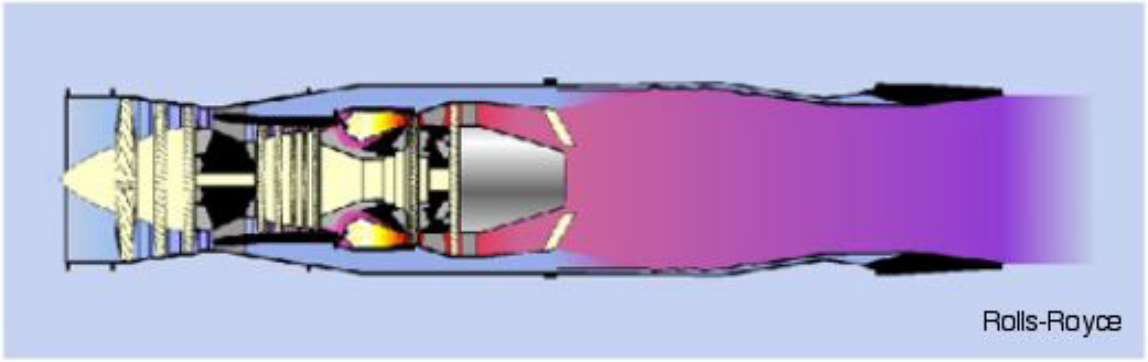
Chapter 2, Question 4:
Integral Momentum Equation

If the exit pressure of this engine is lowered relative to atmospheric pressure. Assuming the mass flow and inlet and exit velocities remain constant,



1) Thrust increases

2) Thrust decreases

3) Thrust stays the same

4) I don't know

L.O. B

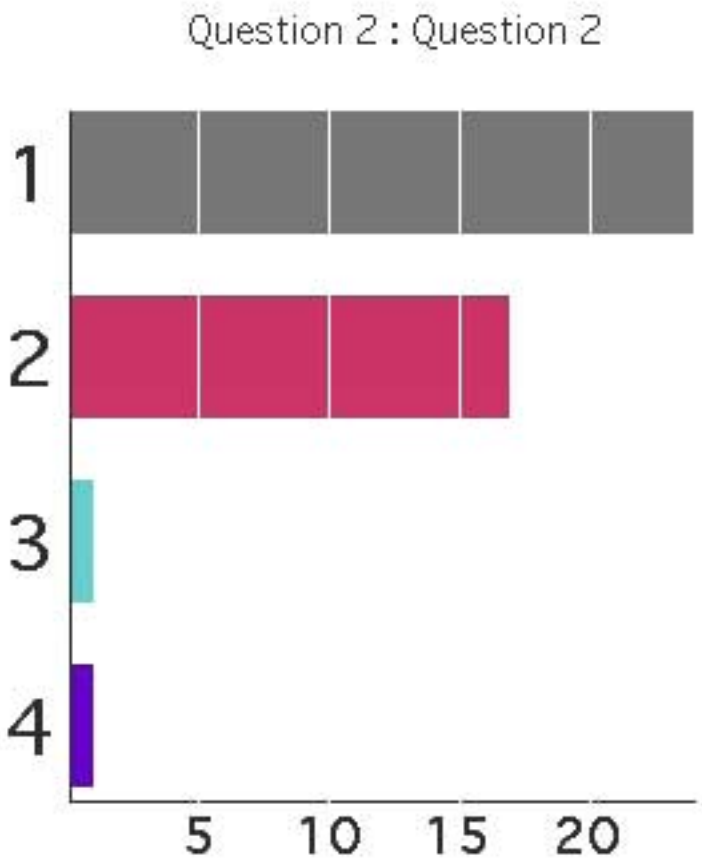
Chapter 2, Question 4 Answer:

The correct answer is 2) Thrust decreases

The thrust will decrease. Lowering the pressure on the back of the engine will cause a net imbalance in pressure forces between the inlet and the exit. This force will be $A_{exit}(p_{exit}-p_{atm})$ and will act in opposition to the thrust force.

Note that when I gave this question to the class I did not have the phrase "Assuming the mass flow and inlet and exit velocities remain constant". Without this phrase, most of you (correctly) assumed that as the exit pressure was reduced, the exit velocity would increase, increasing thrust. It was my intention in asking the problem however, to have you focus only on the term in the thrust equation related to the pressure forces around the engine.

Class performance (2001):


Question 2 : Question 2
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