Week04 Assignment

Due on 2021-02-17, 23:59 IST.

As per our records you have not submitted the assignment.

1. Gas flowing in a tube at velocity of 840 m/s has a static temperature of 150 K. What is the Starl Marsh number M' of the flow? (r = 1.4, P = 2100 kg/m³)

Accepted Answers:
   2.84
   3.4
   4
   4.8
   5.6
   6.2

The answer is incorrect. 

2. A normal shock appears in a flow for the conditions as in the previous question. What is the Mach-number upstream of the shock(Mu)?

Accepted Answers:
   1.34
   1.5
   1.6
   1.7
   1.8
   1.9

The answer is incorrect.

3. Obtain the shock or Expansion waves

No answer is provided.

4. What kind of compression process happens across the normal shock?

Accepted Answers:
   Reversible Adiabatic
   Reversible non-thermal
   Irreversible Adiabatic
   Irreversible isothermal

5. Solve the Mauch numbers of the flow before and after the shock respectively

Accepted Answers:
   M = 2.4 & M_2 = 1.243
   M = 1 & M_2 = 0.43
   M = 1.5 & M_2 = 0.43
   M = 2 & M_2 = 0.43
   M = 2.5 & M_2 = 0.43
   M = 3 & M_2 = 0.43

The answer is incorrect.

6. What is the percentage loss of total pressure (\(\frac{T_1}{T_2}\)) across the shock?

Accepted Answers:
   86.13
   83.67
   81.21
   78.75
   76.31
   73.88

The answer is incorrect.

7. What is the percentage loss of total temperature (\(\frac{T_1}{T_2}\)) across the shock?

Accepted Answers: 32.3%

8. What happens to specific entropy across the shock?

Accepted Answers:
   Increases by an amount of 189.38 J/kgK
   Decreases by an amount of 186.49 J/kgK
   Increases by an amount of 186.49 J/kgK
   Decreases by an amount of 189.38 J/kgK
   Increases by an amount of 186.49 J/kgK
   Decreases by an amount of 186.49 J/kgK

The answer is incorrect.

9. Consider the following conditions (states 1 and 2 represent before and after the normal shock respectively) (consider perfect gas)

   1. M_1 = 0.45
   2. A_1 = \frac{1}{b}
   3. \frac{P_1}{P_2} = 0
   4. M_2 = 0.777
   5. \frac{P_2}{P_1} = \infty
   6. b \rightarrow \infty

What of the above conditions belong to strong shock limit

Accepted Answers:
   3, 4, 5, 6
   1, 2, 3, 5, 6
   1, 2, 3, 4, 6
   2, 3, 4, 5, 6

No answer is provided.

10. Which of the options are true for the weak shock limit

Accepted Answers:
   \(\Delta s = M_1 - 1, M_1 = 1, M_2 = 0, M_2 = 1, M_3 = 0, M_3 = 1\)

No answer is provided.