Unit 7 - Week 5: Expansion Waves and Oblique Shocks

Assignment 5

Due on 2020-10-21, 23:59 IST

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

1) What is a supersonic flow encountering an expansion corner, which of the following flow parameters does not change in the downstream?
   - Static pressure
   - Static temperature
   - Mach number
   - Static temperature
   - Dynamic pressure
   - No, the answer is incorrect.
   - Score: 2
   - Accepted Answer:
     - (d) Static pressure

2) Which number across a weak oblique shock is always a sonic?
   - (a) M
   - (b) $\alpha$?
   - No, the answer is incorrect.
   - Score: 2
   - Accepted Answer:
     - (d) $\beta$?

3) On a curve $\beta = B - M$, if the flow deflection angle increases, for a fixed Mach number, the shock wave angle increases?
   - (a) TRUE
   - (b) FALSE
   - No, the answer is incorrect.
   - Score: 2
   - Accepted Answer:
     - (d) FALSE

4) In certain circumstances, the Prandtl-Meyer function is the difference in Mach angle of the shock and the oblique shock angle of an expansion wave.
   - (a) TRUE
   - (b) FALSE
   - No, the answer is incorrect.
   - Score: 2
   - Accepted Answer:
     - (d) FALSE

Axes: A supersonic stream of air at Mach number 1.5 encounters an expansion corner that deflects the stream by an angle of 10° so that the supersonic Mach number becomes 2.2. Answer the following questions (056) based on the data:

5) The angle (in degrees) of the forward shock one makes with respect to upstream flow direction is____

6) The angle (in degrees) of the rearward shock line makes with respect to upstream flow direction is____

7) The static pressure (in kPa) at the downstream of the oblique shock is____

8) The static temperature (in K) at the downstream of the oblique shock is____

9) The flow deflection angle (in degrees) is____

10) The velocity (in m/s) at the downstream of the flow____

11) The velocity (in m/s) at the downstream of the flow____

12) The velocity (in m/s) at the downstream of the flow____