Assignment-02

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) Mach No. can be expressed as the ratio of______
   - Kinetic Energy/Internal Energy
   - Kinetic Energy/Potential Energy
   - Vibrational Energy/Kinetic Energy
   - Internal Energy/Kinetic Energy
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Kinetic Energy/Internal Energy

2) A supersonic airfoil has a speed of 1 km/s at 30° Mach number. Its skin temperature is 300°K. Find the heat transfer rate (in W/m²).
   - 300
   - 450
   - 600
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - 300

3) In the compressible flow where the velocity of fluid is zero, it is called______
   - critical point
   - sonic point
   - stagnation point
   - supersonic point
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - stagnation point

4) The velocity of a pressure wave in a fluid is given by______ (where K is bulk modulus, \( \rho \) is density of the fluid)
   - \( \sqrt{\frac{K}{\rho}} \)
   - \( \sqrt{\frac{2}{\rho}} \)
   - \( \sqrt{\frac{1}{\rho}} \)
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - \( \sqrt{\frac{K}{\rho}} \)

5) Argon is stored in a reservoir at 500 K. Determine the speed of sound in it (up to 2 decimal places) (Take \( \gamma = 1.64 \) and Molecular Weight of Argon: 39.94)
   - 720 m/s
   - 725 m/s
   - 730 m/s
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - 725 m/s

6) An aircraft is flying at 850 km/hr at an altitude of 10,000 meters \( (\gamma = 1.23, M = 0.8, \rho = 0.264) \). The oil is reversibly compressed in an ideal diffuser. If the Mach number at the exit of the diffuser is 0.36, determine the entry Mach no. (up to 2 decimal places) (Consider \( \gamma = 1.4 \))
   - 0.9
   - 0.89
   - 0.88
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - 0.89

7) An actual shock, which of the following quantities decreases? (Select all correct answers)
   - Total Temperature
   - Density
   - Velocity
   - Mach Number
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Total Temperature
   - Velocity

8) The state of gas \( (\gamma = 1.3 \) and \( P = 450 \text{ kPa} ) \) upstream of a normal shock wave is given as: \( P_1 = 20 \text{ bar}, T_1 = 315 \text{ K} \). The Mach no. downstream of the shock will be______
   - 0.50
   - 0.51
   - 0.52
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - 0.51

9) Which of the following statements is incorrect?
   - A shock wave occurs in divergent section of a nozzle when the compressible flow changes abruptly from subsonic to supersonic state.
   - A supersonic jet at supersonic state is not heard by the stationary observer on the ground, and it passes him because wave of disturbance behind the plane.
   - A converging section is added to a convergent nozzle to obtain supersonic velocity at the throat.
   - None of the above
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - A converging section is added to a convergent nozzle to obtain supersonic velocity at the throat.

10) In which of the following, the sonic velocity is the largest?
    - Water
    - Steel
    - Kanssa
    No, the answer is incorrect.
    Score: 0
    Accepted Answers:
    - Water