Assignment 6

The due date for submitting this assignment has passed.

Due on 2023-01-03, 23:59 IST.

As per our recent you have not submitted this assignment.

There may be more than one correct answer.

1. For a supernova explosion with known energy (E) and ambient density (ρA), the blast wave surface area increases as
   \[ A \propto \left( \frac{E}{\rho_A} \right)^{1/3} \]
   - 1 point

2. The velocity of shock front in case of supernova expansion
   - decreases with time
   - increases with time
   - initially increases then decreases
   - ultimately decreases then increases
   - 1 point

3. Do you believe the answer to increment?
   - Yes
   - 1 point
   Accepted Answer:

4. What happens when a supernova shock enters a de-Laval nozzle?
   - It becomes a subsonic flow at the exit
   - It remains supersonic
   - Depends on the chemical composition of the fluid
   - 1 point
   Accepted Answer: It may become a subsonic flow at the exit

5. The ratio of \(\eta_1 / \eta_2\) will be
   - 2/3
   - 1/4
   - 3/2
   - 2/3
   - 0.5
   - 1 point
   Accepted Answer: customary notation in the radio frequency range and spectral index in the optical range

6. A fluid in hydrostatic equilibrium under gravity is invisible against collision if
   - it requires a greater magnitude than the vertical pressure gradient
   - it requires a greater magnitude than the vertical temperature gradient
   - the Bond number is small
   - the adiabatic index is less than 2
   - 1 point
   Accepted Answer: it requires a greater magnitude than the vertical pressure gradient

7. The ratio of total waves depends on
   - the total energy of the explosion only
   - the total energy of the explosion and the ambient density only
   - the total energy of the explosion and blast waves density only
   - the total energy of the explosion, the ambient density and time
   - 1 point
   Accepted Answer: the total energy of the explosion, the ambient density and time

8. The total energy of the explosion, the ambient density and time
   - 1 point

9. By linear theory, we can analyze
   - the linear wave model in a fluid
   - the linear model in a fluid
   - turbulence
   - all of the above
   - 1 point
   Accepted Answer: all of the above

10. Rankine-Hugoniot conditions are valid
    - in the rest frame of the shock
    - in the frame where the shock is moving
    - only when shock waves are absent
    - 1 point
    Accepted Answer: in the rest frame of the shock