Assignment 2

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

1. For an incompressible flow, \( \nabla \cdot \mathbf{V} = 0 \). The constant is given by

\[ \nabla \cdot \mathbf{V} = 0 \]

\[ \mathbf{V} = (x, y, z) \]

\[ \nabla \cdot \mathbf{V} = \frac{\partial x}{\partial x} + \frac{\partial y}{\partial y} + \frac{\partial z}{\partial z} = 3 

\text{None of the above.}

2. Velocity field corresponding to the velocity inside \( (-1, 1) \) is \( \mathbf{V} = (x, y, z) \).

\[ \mathbf{V} = (x, y, z) \]

\[ (x, y, z) \]

\[ \text{None of the above.} \]

3. Temperature equation for incompressible fluid flow is \( \frac{\partial T}{\partial t} + \mathbf{V} \cdot \nabla T = \nabla \cdot (k \nabla T) \). The correct equation in Fourier space would be

\[ \frac{\partial T}{\partial t} + \mathbf{V} \cdot \nabla T = \nabla \cdot (k \nabla T) \]

\[ \text{None of the above.} \]

4. What one of the following quantities can also be negative?

\[ \text{Density} \]

\[ \text{Pressure} \]

\[ \text{Entropy} \]

\[ \text{None of the above.} \]

5. All the active Fourier modes in the velocity field \( \mathbf{V}(x, y) = x \cos^2(x) + y \sin^2(x) \).

\[ \mathbf{V}(x, y) = x \cos^2(x) + y \sin^2(x) \]

\[ \text{None of the above.} \]

6. Velocity field corresponding to the velocity inside \( (-1, 1) \) is \( \mathbf{V} = (x, y, z) \).

\[ \mathbf{V} = (x, y, z) \]

\[ (x, y, z) \]

\[ \text{None of the above.} \]

7. The Huygens-Fresnel principle for wave propagation is given by

\[ \text{Huygens-Fresnel principle} \]

\[ \text{Fourier optics} \]

\[ \text{None of the above.} \]

8. How many terms are needed for the velocity field

\[ \mathbf{V}(x, y) = x \cos^2(x) + y \sin^2(x) \]

\[ \text{None of the above.} \]

\[ \text{None of the above.} \]

9. Evolution equation of \( A \) and \( B \) for the velocity field \( \mathbf{V} = (x, y, z) \)

\[ \mathbf{V} = (x, y, z) \]

\[ \text{None of the above.} \]

\[ \text{None of the above.} \]

10. Velocity field constructed using the Fourier modes \( \mathbf{A} = (0, 0, 0) \), \( \mathbf{B} = (1, 0, 1) \), \( \mathbf{C} = (0, 1, 0) \), \( \mathbf{D} = (0, 0, 0) \)

\[ \text{None of the above.} \]

\[ \text{None of the above.} \]

\[ \text{None of the above.} \]

\[ \text{None of the above.} \]