Assignment 1

Due on 2020-09-30, 23:59 IST.

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

1. The fluid is defined as a substance in which the
   (A) shear is proportional to strain
   (B) strain rate is proportional to stress
   (C) shear is proportional to stress
   (D) stress is proportional to strain rate

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (B) strain rate is proportional to stress

2. The generic expression of a flow field satisfying the continuity equation is represented as $\nabla \cdot \mathbf{u} = 0$. Identify the correct statement.
   (A) The flow field is steady and uniform.
   (B) The flow field is compressible.
   (C) The flow field is steady.
   (D) The flow field is incompressible.

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (B) The flow field is compressible.

3. The velocity vector is represented as $\nabla \cdot (\mathbf{v} - \mathbf{v}_0) + \mathbf{a} = (\mathbf{u} - \mathbf{u}_0) + \mathbf{a}$. The expression for acceleration of $(2, 4, 7)$ and time $t = 3$ is.
   (A) $\mathbf{a} = 110\mathbf{i} + 1296\mathbf{j} + 572\mathbf{k}$
   (B) $\mathbf{a} = 1296\mathbf{i} + 170\mathbf{j} + 572\mathbf{k}$
   (C) $\mathbf{a} = 572\mathbf{i} + 170\mathbf{j} + 1296\mathbf{k}$
   (D) None of these

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (A) $\mathbf{a} = 110\mathbf{i} + 1296\mathbf{j} + 572\mathbf{k}$

4. A solid rubber ball has its volume reduced by 15% when subjected to uniform stress of 15 kN/m². The bulk modulus (in N/m²) for rubber is.
   (A) $10^9$
   (B) $10^8$
   (C) $10^9$
   (D) $10^3$

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (A) $10^9$

5. The properties that bear the relation to movement of mass, momentum and heat for a fluid, are called as.
   (A) Thermodynamic properties
   (B) Kinematic properties
   (C) Transport properties
   (D) Dynamic properties

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (C) Transport properties

6. The Pascal law is applicable to the liquid, which is ______
   (A) Incompressible
   (B) Compressible
   (C) Both A & B
   (D) None of these

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (A) Incompressible

7. The ratio of the density of oxygen and nitrogen is 20:19. The speed of sound in nitrogen gas at 21°C is equal to speed of sound in oxygen at certain temperature. The temperature is ______.

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (Type: Range) 325, 0.325, 0.0

8. The property of fluid viscosity decreases with the increase in temperature for a liquid and increases with the increase in temperature of a gas.
   (A) True
   (B) False

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (A) True

For Questions 9 and 10 use the following:

Argon gas (characteristics: gas constant 208.3 kg·K, and specific heat ratio 1.67) flows through a tube with initial pressure and density conditions as 1.7 MPa and 38 kg/m³, respectively. The final pressure and temperature are measured as 2.48 kPa and 400 K, respectively.

9. The change in entropy (in J/kg·K) for argon is ______

   No, the answer is incorrect.
   Score: 9
   Accepted Answers:
   (Type: Range) 0.00, 0.00

10. The change in entropy (in J/kg·K) for argon is ______

    No, the answer is incorrect.
    Score: 9
    Accepted Answers:
    (Type: Range) 333.00, 333.00