Week 1 - Assignment 1

The due date for submitting this assignment has passed. **Due on 2017-08-02, 23:59 IST**
As per our records you have not submitted this assignment.

1) Stream-function vorticity formulation removes higher order terms from Navier-Stokes equations. [True / False]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) False

2) Stream-function vorticity formulation can be used for simulating a 3-dimensional flow. [True / False]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) False

3) If dye is injected into a liquid at a fixed point in the flow field, then at a later time t, the dye will indicate the end points of the path lines of particles which have passed through the injection point. [True / False]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) True

4) Match the following

<table>
<thead>
<tr>
<th>a. Dirichlet BC</th>
<th>1. ( \frac{\partial u}{\partial x} = 0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Robin BC</td>
<td>2. ( u + \alpha \frac{\partial u}{\partial x} = 0 )</td>
</tr>
<tr>
<td>c. Neumann BC</td>
<td>3. ( u = U_0 )</td>
</tr>
<tr>
<td>d. Cauchy BC</td>
<td>4. ( u = U_0 ) and ( \frac{\partial u}{\partial x} = 0 )</td>
</tr>
</tbody>
</table>

Accepted Answers:
||| a – 1, b – 2, c – 3, d – 4 | 0 points |
5) If the flow is incompressible, then the ____________ of velocity is zero.

- Curl
- Divergence
- Gradient
- Cross Product

No, the answer is incorrect.
Score: 0

Accepted Answers:
Divergence

6) Timelines and Pathlines correspond to ____________ and ____________ formulations

- Eulerian, Lagrangian
- Lagrangian, Eulerian
- Control volume, system
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Eulerian, Lagrangian

7) Stream lines can be visualized in an experiment where the flow is unsteady.

- Yes
- No
- Yes, provided there is a high-speed camera
- Can be visualized with a PIV setup

No, the answer is incorrect.
Score: 0

Accepted Answers:
No

8) Match the following

<table>
<thead>
<tr>
<th>a. Reynolds number</th>
<th>1. Momentum diffusivity / Thermal diffusivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Nusselt number</td>
<td>2. Inertia force / Gravity force</td>
</tr>
<tr>
<td>c. Prandtl number</td>
<td>3. Inertia force / Viscous force</td>
</tr>
<tr>
<td>d. Froude number</td>
<td>4. Convective heat transfer / Conductive heat transfer</td>
</tr>
</tbody>
</table>

- a – 1, b – 2, c – 3, d – 4
- a – 2, b – 3, c – 4, d – 1
- a – 3, b – 4, c – 1, d – 2
- a – 3, b – 4, c – 2, d – 1
No, the answer is incorrect.
Score: 0
Accepted Answers:
\(a - 3, \ b - 4, \ c - 1, \ d - 2\)

9) Vorticity-Stream function equations are

- Elliptic in nature
- Parabolic in nature
- Hyperbolic in nature
- Mixed in nature

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Parabolic in nature*