Unit 3 - Week 1: Introduction to Computational Fluid Dynamics

Assignment 01

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

Due on 2020-02-12, 23:59 IST.

1) Viscous Burger's equation is , *1 point*

- $\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} = \nu\frac{\partial^2 u}{\partial t^2}$
- $\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} = \nu\frac{\partial^2 u}{\partial x^2}$
- $\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} = \nu\frac{\partial^2 u}{\partial y^2}$
- $u\frac{\partial u}{\partial t} = \nu\frac{\partial^2 u}{\partial y^2}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} = \nu\frac{\partial^2 u}{\partial x^2}$

2) The momentum equation for low Reynolds number flow (Re <1) can be written as *1 point*

- $\frac{\partial(\rho\vec{u})}{\partial t} + \nabla\cdot(\rho\vec{u}\vec{u}) = -\nabla p$
- $\frac{\partial(\rho\vec{u})}{\partial t} = -\nabla p + \nabla\cdot(\mu\nabla\vec{u})$
- $\frac{\partial(\rho\vec{u})}{\partial t} + \nabla\cdot(\rho\vec{u}\vec{u}) = 0$
- $\frac{\partial(\rho\vec{u})}{\partial t} = -\nabla p$

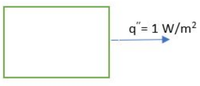
No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{\partial(\rho\vec{u})}{\partial t} = -\nabla p + \nabla\cdot(\mu\nabla\vec{u})$

3) Continuity equation for incompressible flows in Cartesian co-ordinate for $\vec{u}$, is *1 point*

- $\nabla u = 0$
- $\nabla\cdot\vec{u} = 0$
- $\nabla^2 u = 0$
- $\nabla\times\vec{u} = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\nabla\cdot\vec{u} = 0$

4) The boundary condition given in the diagram is *1 point*



- Dirichlet boundary conditions
- Neumann boundary conditions
- Mixed boundary conditions
- Periodic boundary conditions

No, the answer is incorrect.
Score: 0
Accepted Answers:
Neumann boundary conditions

5) Steady heat conduction equation with heat generation in solid body is which type of equation? *1 point*

- Fourier Biot equation
- Laplace equation
- Poisson equation
- Tricomi equation

No, the answer is incorrect.
Score: 0
Accepted Answers:
Poisson equation

6) Which of these will fall in the post-processing category in CFD ? *1 point*

- Defining boundary condition
- Grid generation
- Discretization
- Flow Visualization

No, the answer is incorrect.
Score: 0
Accepted Answers:
Flow Visualization

7) Which of these can be taken as Dirichlet boundary conditions for the variable ϕ at a specified boundary ? *1 point*

- $\frac{\partial^3\phi}{\partial x^3} = 0$
- $\frac{\partial^2\phi}{\partial x^2} = 0$
- $\frac{\partial\phi}{\partial x} = 0$
- $\phi = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\phi = 0$

8) What is the law governing momentum equation? *1 point*

- Newton's first law of motion
- Newton's second law of motion
- First law of thermodynamics
- Second law of thermodynamics

No, the answer is incorrect.
Score: 0
Accepted Answers:
Newton's second law of motion

9) Navier stokes equation is a non linear partial differential equation, the order of the equation is _____ (answer should be given in number)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2

1 point

10) Total number of initial and boundary conditions required for solving the equation $\frac{\partial T}{\partial t} = \frac{\partial^2 T}{\partial x^2}$ are _____ (answer should be in number)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 3

1 point