Unit 2 - Week 2

Week 2-Assignment 1
The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

1) Different ways of discretizing the domain are
   - Finite Volume
   - Finite Element
   - Finite Difference
   - All the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: All the above

2) If all the nodes of a grid has same element connectivity then it is called unstructured mesh. (True or False)

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

3) Advantage of unstructured grid is
   - It solves equation relatively faster
   - It takes time to generate grid
   - More controllable
   - all the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: More controllable

4) Body fitted grids can be under the classification of
   - Structured grid
   - Unstructured grid
   - O- and C- type grids
   - All the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: All the above

5) Order of accuracy of this scheme
   \[ \frac{\partial^2 f}{\partial x^2} = \frac{f_{i+2} - 2f_i + 1 + \Delta x^2}{\Delta x^2} \]
No, the answer is incorrect.
Accepted Answers: 
1

6) Compute the second derivative of the function \( f(x) = \sin \left( \frac{\pi x}{4} \right) \) at, \( x = 1.5 \mu \) second-order central difference using a step size of 0.01

-0.56
-0.92
0.5
0.23

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

7) The third term in Taylor series if \( f(x-(1+\alpha)\Delta x) \) is

\[
\frac{\partial^3 f}{\partial x^3} \left( \frac{(1+\alpha)^3 \Delta x^3}{6} \right)
\]

\[
\frac{\partial^3 f}{\partial x^3} \left( \frac{(1+\alpha) \Delta x^3}{6} \right)
\]

\[
\frac{\partial^3 f}{\partial x^3} \left( \frac{(1+\alpha)^3 \Delta x^3}{3!} \right)
\]

- Both a and c

No, the answer is incorrect.
Score: 0
Accepted Answers: 
Both a and c

8) The values of a function at different values of \( x \) are tabulated below. If \( f'(x) = 20.219 \) at \( x = 3 \), given the step size is 0.2, then which finite difference method yields this result?

<table>
<thead>
<tr>
<th>( x )</th>
<th>( f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>( e^{2.6} )</td>
</tr>
<tr>
<td>2.8</td>
<td>( e^{2.8} )</td>
</tr>
<tr>
<td>3.0</td>
<td>( e^{3.0} )</td>
</tr>
<tr>
<td>3.2</td>
<td>( e^{3.2} )</td>
</tr>
<tr>
<td>3.4</td>
<td>( e^{3.4} )</td>
</tr>
<tr>
<td>3.6</td>
<td>( e^{3.6} )</td>
</tr>
</tbody>
</table>

- Backward difference
- Calculus, that is exact
- Central difference
- Forward difference

No, the answer is incorrect.
Score: 0
Accepted Answers: 
Central difference