Assignment 12

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. **Due on 2018-10-24, 23:59 IST.**

1) Which of the following statement(s) is(are) true for the three-dimensional modelling of a domain using Algebraic Topological Method (ATM)?
- Statement 1: Outer-oriented counterpart for inner-oriented point is volume.
- Statement 2: Inner-oriented counterpart for outer-oriented line is surface.
- Statement 3: Outer-oriented counterpart for inner-oriented volume is point.
- Statement 4: Inner-oriented counterpart for outer-oriented line is volume.

- Only statement 1 is correct.
- Only statement 2 is correct.
- Only statement 3 is correct.
- Only statement 4 is correct.
- Only statements 1 and 2 are correct.
- Only statements 1 and 3 are correct.
- Only statements 1 and 4 are correct.
- Only statements 2 and 3 are correct.
- Only statements 3 and 4 are correct.
- Only statements 1, 2, and 3 are correct.
- Only statements 1, 3, and 4 are correct.
- None of the statements are correct.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*Only statements 1, 2, and 3 are correct.*
3) The main advantage of mimetic method is

- It is a completely explicit method with best possible accuracy to model dispersive media.  
- It provides fastest possible computation for any numerical method.  
- It accurately represents the continuous system with no spurious modes even on rough unstructured grid with discontinuous material coefficients.  
- It does not require any boundary conditions.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only statements 1 and 3 are correct.

4) Which of the following statement(s) is(are) true for mimetic method?

Statement 1: On an unstructured grid mimetic method resembles ATM.
Statement 2: On a structured staggered grid mimetic method resembles Yee's FDTD method.
Statement 3: It is only applicable for frequency-domain.

- Only statement 1 is correct.  
- Only statement 2 is correct.  
- Only statement 3 is correct.  
- Only statements 1 and 2 are correct.  
- Only statements 1 and 3 are correct.  
- Only statements 2 and 3 are correct.  
- All the statements are correct.  
- None of the statements are correct.

No, the answer is incorrect.
Score: 0
Accepted Answers: Only statements 1 and 2 are correct.

5) A co-boundary operator

- Converts 2-cochain into 4-cochain.  
- Converts 4-cochain into 3-cochain.  
- Converts 2-cochain into 3-cochain.  
- Converts 3-cochain into 1-cochain.

No, the answer is incorrect.
Score: 0
Accepted Answers: Only statements 1 and 2 are correct.
No, the answer is incorrect.
Score: 0
Accepted Answers:
converts 2-cochain into 3-cochain.

6) Which of the following statement denotes the correct relationship used in ATM?  
   1 point
   - Scalar electric potential can be represented as 0-cochain associated to 0-simplex in a 0-chain.
   - Electromotance can be represented as 2-cochain associated to 2-simplex in a 2-chain.
   - Fluxes are represented as 2-cochain associated to 1-simplex in a 0-chain.
   - Electromotance can be represented as 1-cochain associated to 0-simplex in a 0-chain.
   - None of these.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Scalar electric potential can be represented as 0-cochain associated to 0-simplex in a 0-chain.

7) The outcome of a boundary operator acting on a 3-simplex is  
   1 point
   - Derivative of the 3-simplex
   - Content of the 3-simplex
   - Closed surface of the 3-simplex
   - None of the above.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Closed surface of the 3-simplex

8) Which of the following statement(s) is(are) true for the two-dimensional modelling of a domain using Algebraic Topological Method (ATM)?  
   1 point
   Statement 1: Outer-oriented counterpart for inner-oriented point is volume.
   Statement 2: Inner-oriented counterpart for outer-oriented line is surface.
   Statement 3: Outer-oriented counterpart for inner-oriented surface is point.
   Statement 4: Inner-oriented counterpart for outer-oriented line is volume.
   - Only statement 1 is correct.
   - Only statement 2 is correct.
   - Only statement 3 is correct.
   - Only statement 4 is correct.
   - Only statements 1 and 2 are correct.
   - Only statements 1 and 3 are correct.
   - Only statements 1 and 4 are correct.
   - Only statements 2 and 3 are correct.
   - Only statements 3 and 4 are correct.
   - Only statements 1, 2, and 3 are correct.
   - Only statements 1, 3, and 4 are correct.
   - None of the statements are correct.

No, the answer is incorrect.
Score: 0
9) Which of the following statement(s) is(are) true?
Statement 1: In the motion reversal process velocity will not change.
Statement 2: In the motion reversal process velocity will change.
Statement 3: In the motion reversal process acceleration will change.
Statement 4: In the motion reversal process acceleration will not change.

[Radio buttons: Only statement 1 is correct.]
[Radio buttons: Only statement 2 is correct.]
[Radio buttons: Only statement 3 is correct.]
[Radio buttons: Only statement 4 is correct.]
[Radio buttons: Only statements 1 and 3 are correct.]
[Radio buttons: Only statements 1 and 4 are correct.]
[Radio buttons: Only statements 2 and 3 are correct.]
[Radio buttons: Only statements 2 and 4 are correct.]
[Radio buttons: None of the statements are correct.]

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only statements 2 and 4 are correct.

10) The 1st and 3rd co-boundary operators correspond to

[Radio buttons: Curl and Divergence operators of vector calculus respectively.]
[Radio buttons: Divergence and Curl operators of vector calculus respectively.]
[Radio buttons: Gradient and Curl operators of vector calculus respectively.]
[Radio buttons: Gradient and Divergence operators of vector calculus respectively.]

No, the answer is incorrect.
Score: 0
Accepted Answers:
Gradient and Divergence operators of vector calculus respectively.

11) Which of the following statement(s) is(are) correct?
Statement 1: Implicit method is inherently stable.
Statement 2: Implicit method is applicable to both time-domain and frequency-domain.
Statement 3: Implicit method does not require time-update equations.
Statement 4: Implicit method does not require global matrix inversion.

[Radio buttons: Only statement 1 is correct.]
[Radio buttons: Only statement 2 is correct.]
[Radio buttons: Only statement 3 is correct.]
[Radio buttons: Only statement 4 is correct.]
[Radio buttons: Only statements 1 and 2 are correct.]
[Radio buttons: Only statements 1 and 3 are correct.]
[Radio buttons: Only statements 1 and 4 are correct.]
[Radio buttons: Only statements 2 and 3 are correct.]
[Radio buttons: Only statements 2 and 4 are correct.]
[Radio buttons: Only statements 3 and 4 are correct.]

No, the answer is incorrect.
Only statements 1, 2, and 3 are correct.
Only statements 1, 2, and 4 are correct.
Only statements 1, 3, and 4 are correct.
Only statements 2, 3, and 4 are correct.
All the statements are correct.
None of the statements are correct.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only statement 1 is correct.

12) The explicit method

- does not require CFL or any other stability condition.
- generates numerical solution in one step without any iterations as compared to implicit method.
- needs less computational time as compared to implicit method for problem domains with large number of cells.
- None of these.

No, the answer is incorrect.
Score: 0
Accepted Answers:
needs less computational time as compared to implicit method for problem domains with large number of cells.