



MTH646 - Partial Differential Equations (Quiz#1)

Total Questions :10

Please read the following instructions carefully!

1. Quiz will be based upon Multiple Choice Questions (MCQs).
2. You have to attempt the quiz online. You can start attempting the quiz any time within given date(s) of a particular subject by clicking the link for Quiz in VULMS.
3. Each question has a fixed time of 90 seconds. So you have to save your answer before 90 seconds. But due to unstable internet speeds, it is recommended that you should save your answer within 60 seconds. While attempting a question, keep an eye on the remaining time.
4. Attempting quiz is unidirectional. Once you move forward to the next question, you can not go back to the previous one. Therefore before moving to the next question, make sure that you have selected the best option.
5. **DO NOT** press **Back Button / Backspace Button** while attempting a question, otherwise you will lose that question.
6. **DO NOT** refresh the page unnecessarily, **specialty** when following messages appear
Saving...
Question Timeout: Now loading next question...
7. **Javascript MUST be enabled** in your browser; otherwise you will not be able to attempt the quiz.
8. If for any reason, you lose access to internet (like power failure or disconnection of internet), you will be able to attempt the quiz again from the question next to the last shown question. But remember that you have to complete the quiz before expiry of the deadline.
9. If any student failed to attempt the quiz in given time then no re-take or offline quiz will be held.

Important Announcement

1. It has come to the University's knowledge that some students are using unfair means while attempting their quiz.
2. The University is monitoring & analyzing the quiz attempts and if a student is found involved in using unfair means, i.e., helping tools/software, Web Extension, Add-ons etc., an Unfair Means Case (UMC) will be made against such student(s) including cancellation of their quiz.

[Start Quiz](#)



MC210400866: ZAHID IQBAL

Time Left 82
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 1 of 10 (Start time: 01:03:21 PM, 19 July 2023)

Total Marks: 1

Gauss-Seidel method is also known as..... Method.

Select the correct option

 Reload Math Equations

- | | |
|----------------------------------|-------------------------|
| ☐ | Gauss elimination |
| ☒ | Successive displacement |
| ☐ | Jacobi's iterative |
| ☐ | Gauss Jordan |

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 84
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 2 of 10 (Start time: 01:03:35 PM, 19 July 2023)

Total Marks: 1

Poisson's partial differential equation is a type of..... partial equation.

Select the correct option

 Reload Math Equations

- | | |
|----------------------------------|---------------|
| ☒ | Elliptical |
| ☐ | None of these |
| ☐ | Parabolic |
| ☐ | Hyperbolic |

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 79 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 3 of 10 (Start time: 01:03:47 PM, 19 July 2023)

Total Marks: 1

The discretized form of 2D Laplace PDE when central difference approximation is applied on both derivatives with uniform step size h in both directions is

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|--|
| ☐ | $w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = 0$ |
| ☐ | $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = \frac{1}{4} f_{i,j}$ |
| ☐ | $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = -4 f_{i,j}$ |
| ☒ | $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = 0$ |

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 77 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 4 of 10 (Start time: 01:04:05 PM, 19 July 2023)

Total Marks: 1

Consider the mesh point $w_l = w_{i,j}$ of the solution domain
where l denotes the labeling to the internal grid points and $l =$

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|--------------------------|
| ☐ | $i + (m + 1 + j)(n - 1)$ |
| ☐ | $j + (m - 1 - i)(n - 1)$ |
| ☒ | $i + (m - 1 - j)(n - 1)$ |
| ☐ | $i + (n - 1 - j)(m - 1)$ |

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 84 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 5 of 10 (Start time: 01:04:24 PM, 19 July 2023)

Total Marks: 1

$$\text{Consider the PDE } \frac{\partial f(x, t)}{\partial t} + c \frac{\partial f(x, t)}{\partial x} = 0$$

which of the following difference approximation will be used to make upwind scheme when $c > 0$

Select the correct option

Reload Math Equations

☐	Forward difference
☐	Central difference
☐	Crank-Nicolson scheme
☒	Backward difference

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 85
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 6 of 10 (Start time: 01:04:38 PM, 19 July 2023)

Total Marks: 1

A finite difference scheme will be stable if the amplification factor G satisfied the following condition,

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|--------------|
| ☐ | $ G < 1$ |
| ☐ | $ G \geq 1$ |
| ☐ | $ G = 1$ |
| ☒ | $ G \leq 1$ |

Click to Save Answer & Move to Next Question

Kinza Proj

Incoming voice call

DECLINE

ANSWER

which of the following difference approximation will be used to make
upwind scheme when $c < 0$

Select the correct option

Reload Math Equations

☐	Central difference
☒	Forward difference
☐	Crank-Nicolson scheme
☐	Backward difference

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 86 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 8 of 10 (Start time: 01:05:00 PM, 19 July 2023)

Total Marks: 1

A finite difference method when applied on PDE will be stable if the amplification factor G is

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|---------------|
| ☒ | Bounded |
| ☐ | None of these |
| ☐ | Unbounded |
| ☐ | Unrestrained |

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 83 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 9 of 10 (Start time: 01:05:11 PM, 19 July 2023)

Total Marks: 1

The discretized form of 2D Laplace PDE for the nonuniform grid spacing in both direction is given by the equation,

Select the correct option

Reload Math Equations

- ☒ $2\left(\frac{h^2}{k^2} + 1\right)w_{i,j} = [(w_{i-1,j} + w_{i+1,j}) + (w_{i,j-1} + w_{i,j+1})]$
- ☐ $4\left(\frac{h^2}{k^2} - 1\right)w_{i,j} = [w_{i-1,j-1} + w_{i+1,j+1} + w_{i+1,j-1} + w_{i-1,j+1}]$
- ☐ $4\left(\frac{h^2}{k^2} + 1\right)w_{i,j} = [(w_{i-1,j} + w_{i+1,j}) + (w_{i,j-1} + w_{i,j+1})]$
- ☐ $2\left(\frac{h^2}{k^2} - 1\right)w_{i,j} = [w_{i-1,j-1} + w_{i+1,j+1} + w_{i+1,j-1} + w_{i-1,j+1}]$

Click to Save Answer & Move to Next Question



MC210400866: ZAHID IQBAL

Time Left 85 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:03 PM, 19 July 2023

Question # 10 of 10 (Start time: 01:05:24 PM, 19 July 2023)

Total Marks: 1

The Crank-Nicolson scheme when applied on heat diffusion equation is

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|----------------------------|
| ☐ | Conditionally stable |
| ☐ | Neither stable nor bounded |
| ☒ | Unconditionally stable |
| ☐ | None of these |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 83
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 1 of 10 (Start time: 01:09:21 PM, 19 July 2023)

Total Marks: 1

The Crank-Nicolson scheme when applied on heat diffusion equation is

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|----------------------------|
| ☐ | None of these |
| ☒ | Unconditionally stable |
| ☐ | Neither stable nor bounded |
| ☐ | Conditionally stable |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 79
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 2 of 10 (Start time: 01:09:35 PM, 19 July 2023)

Total Marks: 1

Consider the mesh point $w_l = w_{i,j}$ of the solution domain
where l denotes the labeling to the internal grid points and $l =$

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|--------------------------|
| ☐ | $j + (m - 1 - i)(n - 1)$ |
| ☒ | $i + (m - 1 - j)(n - 1)$ |
| ☐ | $i + (n - 1 - j)(m - 1)$ |
| ☐ | $i + (m + 1 + j)(n - 1)$ |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 84 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 3 of 10 (Start time: 01:09:52 PM, 19 July 2023)

Total Marks: 1

$$\text{Consider the PDE } \frac{\partial f(x, t)}{\partial t} + c \frac{\partial f(x, t)}{\partial x} = 0$$

which of the following difference approximation will be used to make upwind scheme when $c > 0$

Select the correct option

Reload Math Equations

☐	Crank-Nicolson scheme
☐	Forward difference
☐	Central difference
☒	Backward difference

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 83
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 4 of 10 (Start time: 01:10:04 PM, 19 July 2023)

Total Marks: 1

Which of the following equation represents 2D Poisson partial differential equation?

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|------------------------|
| ☐ | $\nabla u = 0$ |
| ☐ | $\nabla^2 u = 0$ |
| ☒ | $\nabla^2 u = f(x, y)$ |
| ☐ | $\nabla u = f(x)$ |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 86
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 5 of 10 (Start time: 01:10:18 PM, 19 July 2023)

Total Marks: 1

A finite difference method when applied on PDE will be stable if the amplification factor G is

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|---------------|
| ☒ | Bounded |
| ☐ | Unbounded |
| ☐ | Unrestrained |
| ☐ | None of these |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 81
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 6 of 10 (Start time: 01:10:28 PM, 19 July 2023)

Total Marks: 1

Which of the following equation represents 2D Laplace partial differential equation?

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|------------------------|
| ☐ | $\nabla^2 u = f(x, y)$ |
| ☒ | $\nabla^2 u = 0$ |
| ☐ | $\nabla u = 0$ |
| ☐ | $\nabla u = f(x)$ |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 84 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 7 of 10 (Start time: 01:10:44 PM, 19 July 2023)

Total Marks: 1

The discretized form of 2D Laplace PDE when central difference approximation is applied on both derivatives with uniform step size h in both directions is

Select the correct option

Reload Math Equations

- ☐ $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = -4 f_{i,j}$
- ☐ $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = \frac{1}{4} f_{i,j}$
- ☒ $4w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = 0$
- ☐ $w_{i,j} - (w_{i-1,j} + w_{i+1,j}) - (w_{i,j-1} + w_{i,j+1}) = 0$

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 85
sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 8 of 10 (Start time: 01:10:57 PM, 19 July 2023)

Total Marks: 1

Gauss-Seidel method is also known as..... Method.

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|-------------------------|
| ☒ | Successive displacement |
| ☐ | Gauss Jorden |
| ☐ | Gauss elimination |
| ☐ | Jacobi's iterative |

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 85 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 9 of 10 (Start time: 01:11:08 PM, 19 July 2023)

Total Marks: 1

$$\text{Consider the PDE } \frac{\partial f(x, t)}{\partial t} + c \frac{\partial f(x, t)}{\partial x} = 0$$

which of the following difference approximation will be used to make upwind scheme when $c < 0$

Select the correct option

Reload Math Equations

☐	Central difference
☐	Crank-Nicolson scheme
☐	Backward difference
☒	Forward difference

Click to Save Answer & Move to Next Question



MC210402379: SOBIA ASLAM

Time Left 79 sec(s)

MTH646 - Partial Differential Equations (Quiz#1)

Quiz Start Time: 01:09 PM, 19 July 2023

Question # 10 of 10 (Start time: 01:11:20 PM, 19 July 2023)

Total Marks: 1

Which of the following discretized factor is utilized to check the stability of finite difference scheme in Fourier transform,

Select the correct option

Reload Math Equations

- | | |
|----------------------------------|--------------------------------|
| ☒ | $u_{i,j} = G^j e^{lkx}$ |
| ☐ | $u_{i,j} = G^j e^{lk\Delta y}$ |
| ☐ | $u_{i,j} = G^i e^{lkx}$ |
| ☐ | $u_{i,j} = G^j e^{l\Delta x}$ |

Click to Save Answer & Move to Next Question