Unit 8 - Week 6: Hyperbolic Equations

Assignment 6

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

Due on 2020-03-11, 23:59 IST.

1) Which among the following schemes is unconditionally unstable while solving a one-dimensional wave equation?
   - FTCS
   - BTCS
   - Leap Method
   - Crank-Nicolson Method
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: BTCS

2) The number of time levels required to solve a one-dimensional hyperbolic equation using Leap Flog method is
   - 1
   - 2
   - 3
   - 4
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: 1

3) What is the main disadvantage of explicit schemes in time-dependent problems?
   - Marching solution
   - Simultaneous equations
   - Small time step size
   - Small grid size
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: Small time step size

4) The Leap-Frog technique is
   - explicit method
   - implicit method
   - both method
   - none of the above
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: both method

5) Which value is predicted in the predictor step of the MacCormack technique?
   - variable at the current time step
   - variable at the next time step
   - time derivative of variable at the current time step
   - time derivative of variable at the next time step
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: variable at the next time step

6) The series expansion used in formulating the Leap-Frog method is
   - Laurent series
   - Maclaurin series
   - Fourier series
   - Taylor series
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: Taylor series

7) The condition of stability for solving inviscid Burgers equation using Lax method is
   - \[ |\phi| \leq 1 \]
   - \[ |\phi| \leq 1 \]
   - \[ |\phi| \leq 1 \]
   - \[ |\phi| \leq \frac{1}{2} \]
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: \[ |\phi| \leq \frac{1}{2} \]

8) In the Lax method we replace the term \( u_i \) with the averaged term \( \frac{u_{i+1} + u_{i-1}}{2} \).
   - True
   - False
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers: False