X

Unit 5 - week 4 - Convection term discritisation + High resolution schemes

Register for Certification exam

Course outline

How to access the portal

Week 1 - Linear solvers

Week 2 - Linear solvers + Convection term discretisation

Week 3 - Convection term discretisation

week 4 - Convection term discritisation + High resolution schemes

- Convection term discretisation-VIII
- Convection term discretisation-IX
- High Resolution Schemes-I
- High Resolution Schemes-II

Assignment 4

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2019-02-27, 23:59 IST.**

1) Central difference discretisation of the convection term can lead to unphysical solutions because ***1 point***

- Truncation error for central difference scheme is first order
- Truncation error for central difference scheme is second order
- Central difference scheme has no inherent convective stability for odd derivative
- Central difference scheme has no inherent convective stability for even derivative

No, the answer is incorrect.
Score: 0

Accepted Answers:
Central difference scheme has no inherent convective stability for odd derivative

2) The values at the faces in a second order upwind scheme is obtained by ***1 point***

- Interpolation of values from upwind and far-upwind nodes
- Interpolation of values from downwind and upwind nodes
- Extrapolation of values from upwind and far-upwind nodes
- Extrapolation of values from downwind and upwind nodes

No, the answer is incorrect.
Score: 0

Accepted Answers:
Extrapolation of values from upwind and far-upwind nodes

3) Which statement is true for second order upwind scheme? ***1 point***

$$\frac{\partial \rho\phi}{\partial t} = -\frac{\partial \rho u\phi}{\partial x} + \frac{\partial}{\partial x}(\Gamma \frac{\partial \phi}{\partial x}) + Q = RHS$$

No, the answer is incorrect.
Score: 0

Accepted Answers:
For stability, $\frac{\partial(RHS)}{\partial\phi_c} < 0$ in uniform velocity

4) QUICK scheme is **1 point**

- first order accurate
- second order accurate
- third order accurate
- fourth order accurate

No, the answer is incorrect.
Score: 0

Accepted Answers:
third order accurate

5) FROMM scheme is **1 point**

- first order accurate
- second order accurate
- third order accurate
- fourth order accurate

No, the answer is incorrect.
Score: 0

Accepted Answers:
second order accurate

6) At small Peclet number (Pe=1), accuracy of the higher order schemes is as follows **1 point**

- Upwind < SOU < FROMM < QUICK
- Upwind > SOU > FROMM > QUICK
- Upwind < FROMM < SOU < QUICK
- Upwind > FROMM > SOU > QUICK

No, the answer is incorrect.
Score: 0

Accepted Answers:
Upwind < SOU < FROMM < QUICK

7) At large Peclet number (Pe=10), stability of the higher order schemes is as follows **1 point**

- Upwind < SOU < QUICK < CD
- Upwind > SOU > QUICK > CD
- Upwind < QUICK < SOU < CD
- Upwind > QUICK > SOU > CD

No, the answer is incorrect.
Score: 0

Accepted Answers:
Upwind > SOU > QUICK > CD

8) Reasons for instability of higher order schemes at high Peclet number could be **1 point**

- Imposed boundary condition at the exit from the domain
- Large gradients in the domain such as presence of shock wave

- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both of the above

Previous Page End