Unit 14 - Week 12: SIMPLE Algorithm

Assignment 12

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

Due on 2020-04-22, 23:59 IST.

1) The pressure term in discretized x-momentum equation for cell center P on uniform grid is *1 point*

- $(p_e - p_w)\Delta y$
- $(p_w - p_e)\Delta y$
- $(p_e - p_w)\Delta x$
- $(p_w - p_e)\Delta x$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$(p_w - p_e)\Delta y$

2) The discretized continuity equation for cell center P on uniform three-dimensional grid can be written as *1 point*

- $(u_e - u_w)\Delta y\Delta z + (v_n - v_s)\Delta x\Delta z + (w_t - w_b)\Delta x\Delta y = 0$
- $(u_e - u_w)\Delta x\Delta y + (v_n - v_s)\Delta y\Delta z + (w_t - w_b)\Delta z\Delta x = 0$
- $(u_w - u_e)\Delta x\Delta y + (v_n - v_s)\Delta y\Delta z + (w_t - w_b)\Delta z\Delta x = 0$
- $(u_w - u_e)\Delta x\Delta y + (v_s - v_n)\Delta y\Delta z + (w_t - w_b)\Delta z\Delta x = 0$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$(u_e - u_w)\Delta y\Delta z + (v_n - v_s)\Delta x\Delta z + (w_t - w_b)\Delta x\Delta y = 0$

3) In SIMPLE algorithm, correction u-velocity at east face center of main control volume P is written as *1 point*

- $u'_e = (p'_E - p'_P)\frac{\Delta y}{a_e}$
- $u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e}$
- $u'_e = (p'_E - p'_P)\frac{\Delta y}{a_e - \sum a_{nb}}$
- $u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e - \sum a_{nb}}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e}$

4) In SIMPLEC algorithm, correction u-velocity at east face center of main control volume P is written as *1 point*

- $u'_e = (p'_E - p'_P)\frac{\Delta y}{a_e}$
- $u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e}$
- $u'_e = (p'_E - p'_P)\frac{\Delta y}{a_e - \sum a_{nb}}$
- $u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e - \sum a_{nb}}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$u'_e = (p'_P - p'_E)\frac{\Delta y}{a_e - \sum a_{nb}}$

5) In SIMPLER algorithm, the discretized pressure correction equation in main control volume P is $a_P p'_P = \sum a_{nb} p'_P + b$ where the expression for b is *1 point*

- $b = 0.5(F^*_w - F^*_e + F^*_s - F^*_n)$
- $b = 0.5(F^*_e - F^*_w + F^*_n - F^*_s)$
- $b = F^*_w - F^*_e + F^*_s - F^*_n$
- $b = F^*_e - F^*_w + F^*_n - F^*_s$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$b = F^*_w - F^*_e + F^*_s - F^*_n$

6) In which of the following algorithm(s) the pressure equation is solved? *1 point*

- SIMPLE
- SIMPLER
- SIMPLEC
- All of the above

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

7) SIMPLE algorithm proposed by S. V. Patankar uses collocated grid. *1 point*

- True
- False

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

8) SIMPLE algorithm is computationally faster than SIMPLER with same initial guess values. *1 point*

- True
- False

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

9) SIMPLE algorithm was proposed by S. V. Patankar for steady Navier-Stokes equations. *1 point*

- True
- False

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