Unit 4 - Week 3: Fundamentals of Flow

Assignment 03: Fundamentals of flow

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Module 3: Fundamentals of Flow

Assignment 3

Important notes:

(i) All questions are mandatory
(ii) No negative marking for the wrong answer
(iii) All questions have only one correct answer

1) For irrotational flow, the angular velocity is

- 1
- 0
- Infinite
- None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:

2) The circulation is equal to the

- Flux
- Vorticity
- Ratio of vorticity and area
- Product of vorticity and area

No, the answer is incorrect.
Score: 0

Accepted Answers:

Product of vorticity and area

3) If the components of rotation are 0, h, and -b respectively. The flow is

- Rotational
- Irrotational
- Data insufficient
- None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:

Rotational

4) The circle $x^2 + y^2 - 2ay = 0$ is situated in two dimensional flow with $u = ky; v = 0$. K is an arbitrary constant and $a$ is the radius of circle. The circulation about the circle is

- $Ka^2$
- $Kpa^2$
- $-Kpa^2$
- $-Ka^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$-Kpa^2$

5) If the components of velocity are 5, 3 and 6. Calculate the resultant velocity

- 70
- 70/3
- 8.37

No, the answer is incorrect.
Score: 0

Accepted Answers:

8.37
6) The stream function of a flow is given by the expression, \( y = 2x^2 - y^2 \). Find out the resultant velocity at a point denoted by \( x = 2, y = 3 \).

No, the answer is incorrect.
Score: 0
Accepted Answers: 2

7) The slope of potential line \( \times \) slope of stream line is equal to the

-1 1 0 1/2

No, the answer is incorrect.
Score: 0
Accepted Answers: -1

8) In steady state flow, which of the followings does not change with time

- Density
- Pressure
- Velocity
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers: All of the above

9) The velocity profiles do not change with respect to the downstream coordinate, then flow is called

- Undeveloped flow
- Developed flow
- Steady state flow
- None of the above

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

10) For transient flow, the value of Reynolds number may vary between

- 1450-9870
- 1200-4500
- 2300-6000
- 6000-9000

No, the answer is incorrect.
Score: 0
Accepted Answers: 2300-6000

11) A ball flying in the air. The air flow around the ball is

- One-dimensional flow
- Two-dimensional flow
- Three-dimensional flow
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers: Three-dimensional flow

12) A fluid particle running through a river flow, undergoing

- Deformation
- Rotation
- Both (a) and (b)
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers: Both (a) and (b)

13) Which one is true for steady flow

- Streakline, streamline and pathline are same
- Only streamline and pathline are same

No, the answer is incorrect.
Score: 0
Accepted Answers: Both (a) and (b)
<table>
<thead>
<tr>
<th>Question</th>
<th>Correct Answer</th>
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<tbody>
<tr>
<td>Only streakline and streamline are same</td>
<td>None of the above</td>
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<td>No, the answer is incorrect.</td>
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<td>Accepted Answers:</td>
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<tr>
<td>Streakline, streamline and pathline are same</td>
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<td>The surface integral of vorticity is equal to the circulation. This relationship is called</td>
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<tr>
<td>Newtons' theorem</td>
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<td>Dalton's theorem</td>
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<td>Stokes' theorem</td>
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<td>In a two-dimensional flow, the components of velocity are given as u = ax and v = -ay. Determine the position of the fluid particle located at t = 3 s of particle located at (1, 2). The value of a = 0.3 s⁻¹.</td>
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<td>2.46 m and 0.81 m</td>
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