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NPTEL

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Unit 7 - Week 6: Atomization theory

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Linear stability
analysis -
Cylindrical jet
instability-1

Linear stability
analysis -
Cylindrical jet
instability-2

Assignment 6

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-03-13, 23:59 IST.**

1) As per the dispersion relation of capillary instability discussed in the lectures, under which condition liquid jet will be stable for any disturbance? **1 point**

- $m=0, 0 < k/k_c < 1$
- $m=0, 0 < k/k_c > 1$
- $m \neq 0, 0 < k/k_c < 1$
- $m \neq 0, 0 < k/k_c > 1$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$m=0, 0 < k/k_c > 1$

2) Dispersion diagram in stability analysis is a plot between **1 point**

- growth rate (ω) and circumferential wavenumber (m)
- axial wavenumber (k) and circumferential wavenumber (m)
- growth rate (ω) and axial wavenumber (k)
- all the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

growth rate (ω) and axial wavenumber (k)

3) The unperturbed radius of cylindrical jet $r=R$, small perturbation is added as $\eta = \eta_0 e^{im\theta}$. The circumferential wave number (m) corresponds to 2, give rise to **1 point**

- axisymmetric mode
- translated by η_0

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Planar Liquid Sheet instability -2

Quiz : Assignment 6

Week - 6 Feedback Form

Week 7: Spray theory

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Week 11: Multiphase flow models of sprays

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4) For the above question, $m = 0$ give rise to

1 point

- axisymmetric mode
- translated by η_0
- dumbbell shape
- none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

axisymmetric mode

5) For the above question the disturbance is a

1 point

- constant
- exponent
- function of θ
- none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

constant

6) If the radius of the cylindrical column of water exiting a bathroom faucet is 10mm, what could be the likely radius of the spherical drop formed from that column?

1 point

- 42.3mm
- 10.6mm
- 21.1mm
- 31.7mm

No, the answer is incorrect.

Score: 0

Accepted Answers:

21.1mm

7) The infinitely long cylindrical liquid jet is at Rayleigh's condition, the azimuthal wave number (m) is greater than zero then the growth rate (ω) will

1 point

- be constant
- grow
- decay
- become zero

No, the answer is incorrect.

Score: 0

Accepted Answers:

decay

8) In the planar liquid sheet instability, the mode which is usually responsible for thinning and thickening of the liquid sheet is known as

1 point

- sinuous mode
- sino-varicose mode
- varicose mode

none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

varicose mode

9) The gaseous sheet enters a quiescent liquid refer to which of the following modes of instability? **1 point**

- varicose mode
- sinuous mode
- sino-varicose mode
- none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

varicose mode

10) In the planar liquid sheet instability the most unstable wave number grows **1 point**

- along the flow direction x
- perpendicular to the flow direction y
- into the z - direction
- all the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

along the flow direction x

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