Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-03-14, 23:59 IST.**

Submitted assignment

1) A Pitot tube is placed in the flow stream as shown in the figure. Determine the velocity of the stream if density of manometric fluid 13600 kg/m³ and density of flowing liquid 1000 kg/m³. Locations of the elevation levels are given, **(Assumption: Ignore elevation difference between a and c, b and d)**

![](image)

No, the answer is incorrect.

Score: 0

Accepted Answers:

- 2.486
- 4.568
- 8.969
- 10.223

2) In a dual beam LDA experiment, two laser light beams cut each other at the measurement point. The angle between the two beams from the point of intersection is 45°. If Nd-YAG laser of 1320 nm wavelength is used in the experiment. The calculate the following:

Distance between two consecutive bright fringes in Nano-meter

- 1650.45 nm
- 1724.66 nm
- 1845.96
- None of the above
No, the answer is incorrect.
Score: 0
Accepted Answers:

1) If seed particle takes 2 μs to cut the two successive bright fringes, then calculate the velocity of the light particle in cm/s

- 64.02
- 86.23
- 95.96
- None of the above

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

2) Calculate the Doppler shift frequency in sec⁻¹

- 640218.23
- 862312.50
- 499981.70
- None of the above

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

3) Beat frequency or Doppler frequency

- \(\frac{f_{11} - f_{22}}{2} = \frac{V}{\lambda} \cos\left(\frac{\theta}{4}\right) \sin\left(\frac{\theta}{4}\right)\)
- \(\frac{f_{12} - f_{21}}{2} = \frac{2V}{\lambda} \cos(\theta) \sin\left(\frac{\theta}{4}\right)\)
- \(\frac{f_{11} - f_{22}}{2} = \frac{V}{\lambda} \sin\left(\frac{\theta}{2}\right)\)
- Both b and c are correct

No, the answer is incorrect.
Score: 0
Accepted Answers: 
Both b and c are correct

4) Important features of dual beam analyser of LDA

- One of the beam falls directly on PMT
- Some of the scattered beam will travel in same direction of reference beam
- Pass through aperture and mix the reference beam
- All the above

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

5) Scattering principle of LDA is based on physical effect of

- Mie scattering
- Rayleigh scattering
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers: 
Mie scattering
9) In the above question if the laser sheet thickness is increased to 20 mm then what will be the concentration requirement per unit volume (in cm³) to maintain an image density of 20.
- 125
- 140
- 240
- 90

No, the answer is incorrect.
Score: 0
Accepted Answers:
Both are correct

10) In the above question if the laser sheet thickness is increased to 20 mm then what will be the concentration requirement per unit volume (in cm³) to maintain an image density of 20.
- 83.9
- 62.5
- 78.5
- 53.4

No, the answer is incorrect.
Score: 0
Accepted Answers:
62.5

11) Which of the factors affect the accuracy of RPT?
- Activity of the source
- Solid angle
- Arrangement of the detector
- All of these

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

12) Limitations of HWA?
- High level fluctuations can influence the mean voltage measured across the heated wire
- Cant evaluate back mixing
- Thermal wake from one wire could affect the measurements on another probe for a multi-component hot-wire probe
- All of these

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

13) Intensity of scattered light by seed particle depend on
- The normalized particle diameter
- Total incident intensity illuminating the particle
- The scattering angle
- All of these

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

14) Optical fiber probes was used to measure the velocity of mono dispersed bubbles in gas liquid column, if the time taken for the bubble to reach probe 1 is 10 millisecond, probe 2 is 11 millisecond and probe 3 is 15 millisecond find mean time
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15) The time taken for bubble to cross the probes is given by 15 millisecond, 12 millisecond, 10 millisecond, or None of these. No, the answer is incorrect. Score: 0

Accepted Answers: 12 millisecond

16) Find the velocity of bubble (in sec) if the distance between protruded probe and other three planar probes is 500 micro meter.

- 1.23
- 3.89
- 4.16
- 10.23

No, the answer is incorrect. Score: 0

Accepted Answers: 4.16

17) PEPT gives

- Lagrangian track of particle
- Eularian track of particle
- First Eulerain track then transformed to Lagrange track
- None of these

No, the answer is incorrect. Score: 0

Accepted Answers: Lagrangian track of particle

18) During run of fluidized bed a capacitance probe was used, Find the solid concentration (in ppm) at measured voltage output at actual condition if solid concentration at packed bed condition is 50 ppm, voltage output only for the gas is 0.5V, voltage output at packed bed condition is 10V and the voltage measured at actual condition is 5V.

- 23.68
- 30.23
- 40.21
- 50.69

No, the answer is incorrect. Score: 0

Accepted Answers:
23.68

18) Which transform is used for reconstruction of images from medical CT scans

- Abel inverse transform
- Radon inverse transform
- Fourier transform
- All the above

**No, the answer is incorrect.**

Score: 0

Accepted Answers:

*All the above*

19) Computed tomography X-ray techniques allow the test component to be

- Viewed from different angles
- Viewed in various cross sectional slices
- Analysed for chemical composition
- None of the above

**No, the answer is incorrect.**

Score: 0

Accepted Answers:

*Viewed in various cross sectional slices*

20) If we take a system with some dimensions (d>1) with energy to be E if we take $\theta = \arctan \left( \frac{\text{X}}{\text{Y}} \right)$ ergodicity will be reached?

- Theta covers all different angles
- Ergodicity does not depend on this angles
- System has less chaos
- All are wrong

**No, the answer is incorrect.**

Score: 0

Accepted Answers:

*Theta covers all different angles*