Unit 3 - Week 2: Drop size and velocity distributions

Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2019-02-13, 23:59 IST.

1) Choose the following observation have infinitely many (i.e. real) outcomes

- [ ] Spray droplet size
- [ ] Spray cone angle
- [ ] Spray droplet velocity
- [ ] All the above

**No, the answer is incorrect.**

**Score:** 0

**Accepted Answers:**

- All the above

2) If \( f(r) \) is the probability density function and \( dr \) is bin width then summation of \( f(r)dr \) is

- [ ] 1
- [ ] 0
- [ ] -1
- [ ] Infinity

**No, the answer is incorrect.**

**Score:** 0

**Accepted Answers:**

- 1

Click here to view the data sheet.

The data sheet has 10,000 droplets arrival time (s), size (μm) and velocity (m/s). The data was measured in the atomizer exit using PDPA equipment. Analyze the data and answer the following questions.
4) What is the Area mean diameter, $D_{20}$ (in μm) for the entire data set?  
   - 36.9
   - 29.8
   - 53.8
   - 69.8

No, the answer is incorrect.  
Score: 0
Accepted Answers: 46.8

5) What is the Sauter Mean Diameter, $D_{32}$ (in μm) for the entire data set?  
   - 74.9
   - 83.9
   - 37.3
   - 49.8

No, the answer is incorrect.  
Score: 0
Accepted Answers: 83.9

6) What is the value of $D_{43}$ for the entire data set?  
   - 111
   - 132
   - 100
   - 110

No, the answer is incorrect.  
Score: 0
Accepted Answers: 110

7) What is the probability of finding a drop in the range $30\mu m \leq D_i \leq 40 \mu m$?  
   - 0.39
   - 0.29
   - 0.11
   - 0.40

No, the answer is incorrect.  
Score: 0
Accepted Answers: 0.29

8) What is the mean velocity (in m/s) of the drops in the range $10\mu m \leq D_i \leq 20 \mu m$?  
   - 1.27
If the total drops are divided into two halves: slower half and faster half.

The value of $D_1$ and $D_2$ (in μm) for the slower half are:

- $32.8$ and $56.8$
- $76.8$ and $28.4$
- $38.7$ and $64.3$
- $28.4$ and $44.4$

No, the answer is incorrect.
Score: 0
Accepted Answers: $38.7$ and $64.3$

For the above question, what are the values of $D_1$ and $D_2$ (in μm) for the faster half?

- $38.7$ and $64.3$
- $71.1$ and $101.8$
- $28.4$ and $44.4$
- $28.4$ and $76.8$

No, the answer is incorrect.
Score: 0
Accepted Answers: $71.1$ and $101.8$