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Unit 2 - Week 1 : Quality Engineering, Quality Function Deployment

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Course outline

How to access the portal?

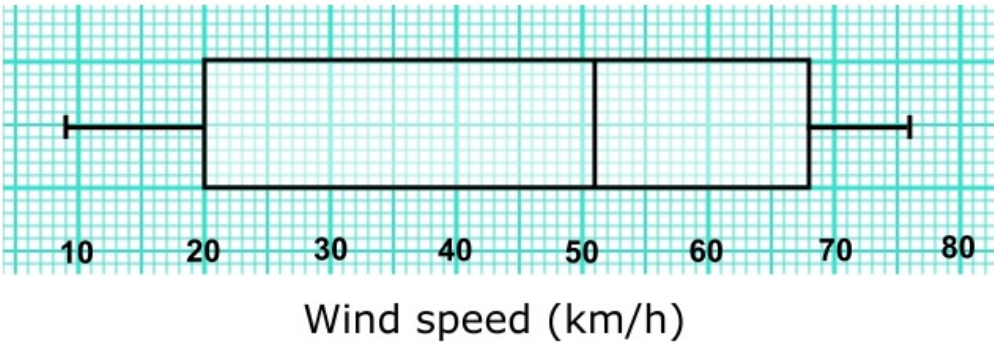
Week 1 : Quality Engineering, Quality Function Deployment

- Lecture-01: Introduction to Statistics
- Lecture-02: Introduction to Probability Theory
- Lecture-03: Distribution of a Random Variable - I
- Lecture-04: Distribution of a Random Variable - II
- Lecture-05(Part-I): Interval Estimation - I
- Lecture-05(Part-II): Interval Estimation - II
- Quiz : Assignment-01
- Assignment-01 (Solution)

Assignment-01

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

1) Answer the question based on the data given below: ***1 point***



What is the number of days the wind speed was between 20 km/h and 51 km/h?

- 30
- 60
- 90
- 120

No, the answer is incorrect.
Score: 0

Accepted Answers:
30

2) Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A? ***1 point***

- 44 / 69
- 25 / 69
- 13 / 24

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Week 3 : Introduction to Design of Experiments

Week 4 : Factorial Design

Week 5 : Factorial Design of Experiments

Week 6 : Design and Analysis Topics for Factorial and Fractional Factorial Designs

Week 7 :Factorial and Fractional Factorial Designs Introduction to Linear Regression Models

Week 8 : Fitting Regression Models

Slides and Reading Material

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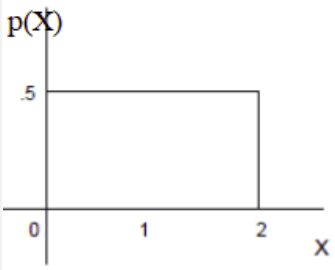
3) For the uniform distribution, illustrated below, which of the following statements, mentioned below, is/ are true? ***1 point***



(I) The mean is smaller than the median.
(II) P(0.1 < X < 0.7) = 0.6
(III) P(X > 0.5) = 0.75

- Only I
- I and II
- II and III
- Only III

No, the answer is incorrect.
Score: 0

Accepted Answers:
Only III

4) At the finished goods stores quality check center, it has been determined that defective product arrive at the checkout section according to a Poisson distribution at an average rate of 12 defective products per hour. What is the probability that at least 1 defective product will arrive at the checkout section in the next hour? ***1 point***

- $\frac{12^1 e^{-12}}{1!}$
- $1 - \frac{12^0 e^{-12}}{0!}$
- $\frac{12^0 e^{-12}}{0!}$
- $1 - \frac{12^1 e^{-12}}{1!}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1 - \frac{12^0 e^{-12}}{0!}$

5) There are 6 bulbs in a box out which 3 are defective. If 2 bulbs are picked randomly, find the probability that at least one is defective. ***1 point***

- 0.2
- 0.5
- 0.6
- 0.8

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.8

6) Defective tires arrive at the quality check center (QCC) at a random rate of 6/hour. The probability that during any 90-minute period, the number of defective tires arriving at the QCC is at least 10 is: **1 point**

- 0.413
- 0.587
- 0.706
- 0.294

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.413

7) In probability and statistics, the logarithmic distribution (also known as the logarithmic series distribution or the log-series distribution) is a discrete probability distribution derived from the _____ series expansion. **1 point**

- Taylor
- Euler
- Maclaurin
- Dirichlet

No, the answer is incorrect.
Score: 0

Accepted Answers:
Maclaurin

8) If defective bulbs arrive at the quality check center every 20 seconds, what is the probability of waiting less than or equal to 30 seconds? **1 point**

- 0.22
- 0.78
- 0.86
- 0.14

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.78

9) Which of the following options is FALSE about cumulative distribution function? **1 point**

- F(X) is non-decreasing in X = x, i.e., if x1 < x2, then F(X = x1) < F(X = x2)
- $limF(x) = 0 as x \to -\infty$
- $limF(x) = 1 as x \to +\infty$
- F(x) is right continuous

No, the answer is incorrect.
Score: 0

Accepted Answers:
$limF(x) = 1 as x \to +\infty$

10) What is the probability that this week's production is at least 100? **1 point**

- 0.01
- 0.02
- 0.05
- 0.50

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.50

11) If the variance of a week's production is known to equal 25, can we obtain a better bound for part mention in question no. 10? ***1 point***

- Yes
- No
- May be
- Need more information in order to make a conclusion

No, the answer is incorrect.
Score: 0

Accepted Answers:
Yes

12) What test would you use to determine whether a set of observed frequencies differ from their corresponding expected frequencies? ***1 point***

- The t test for dependent samples.
- The chi-square test.
- The t test for independent samples.
- The F test.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The chi-square test.

13) The main difference between the z and t-tests is that ***1 point***

- for a t-test, the population mean and standard deviation are needed.
- for a t-test only the sample mean is needed.
- for a z-test the population mean and standard deviation are needed.
- the z and t-tests are identical except for the size of the sample used.

No, the answer is incorrect.
Score: 0

Accepted Answers:
for a z-test the population mean and standard deviation are needed.

14) How does the shape of the t-distribution change as the sample size increases? ***1 point***

- It becomes broader.
- It becomes skewed.
- It becomes flatter.
- It becomes more normal looking.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It becomes more normal looking.

15) If Maggu want to compare the performance of a particular group to an established, accepted average but information about the population standard deviation is not available. Maggu should ***1 point***

- conclude that this cannot be done.
- conduct a one-sample t-test.
- conduct a one-sample z-test.

conduct a correlated t -test.

No, the answer is incorrect.
Score: 0

Accepted Answers:
conduct a one-sample t-test.

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