Assignment 00

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) Suppose that an electronic system contains 2 identical components which function independently of each other and which are connected in series so that the system fails as soon as any one of the two components fail. Suppose also that the life in hours of each components follows the exponential distribution with mean 50.
   a) Obtain the pdf of the life of the system.
   b) Out of 200 such systems how many do you expect to last for at least 50 hours?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

2) Suppose it is known that the survival time of a particular type of bulb has the exponential distribution with mean $\lambda$ (in hours which is unknown). You test 10 such bulbs and find their respective survival times as 150, 225, 275, 300, 95, 155, 325, 75, 20 and 400 hours respectively. What is the probability that an exactly similar type of bulb will last for at least 250 hours.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

3) A research worker wishes to estimate the mean of a population by carrying a sample large enough so that the probability is 0.95 that the sample mean will not differ from the population mean by more than 25% of the standard deviation. How large a sample should the researcher take. Make any assumption if necessary.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

4) A random sample of 20 boys and 15 girls were given a standardized test to test their IQ. The average grade of the boys was 78 with a standard deviation for the sample as 6, while the girls made an average of 84, with a standard deviation for the sample as 8. Your friend after a cursory glance says that these scores definitely prove that boys have a more consistent IQ score than girls. Is he correct in his deduction? Assume that the IQ test scores for both boys and girls are normally distributed. Take level of significance as 5%.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

5) A In a doll factory, machines M1, M2 and M3 manufacture respectively 45, 25 and 30 percent of the total output of production. Out of their respective production 6, 8, and 3 percent are defective. A doll is chosen at random from the production process and found to be defective. What is a probability that it was manufactured by machine M1?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD
6) In order to find out how the students have been performing in the Mathematics subject under CBSE (Class XII), you take a sample of 30 students and find that their average marks is 72, while the standard error is 20. Find a 90% CI for the mean marks obtained for all students who have taken the Mathematics examination under CBSE (Class XII).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

7) An electrical component has a life $X$ (in units of 100 hours) which is a random variable such that $f(x) = \exp(-x)$; $x > 0$. The cost of manufacturing one component is Rs. 20. The manufacturer sells the item for Rs. 50, but guarantees a total refund to his/her customer if the functioning life of the component is less than or equal to 0.9. What is the manufacturer's expected profit per unit?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

8) The height, $X$, of boy studying in class II of any school in the city of Kanpur, is normally distributed with unknown mean $\mu$ and known variance of 25. What is the probability that any boy selected at random will be between 120 cms and 130 cms. You know that the heights of 5 such boys who have been selected as the sample are, 120, 100, 110, 140 and 130.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

9) Let $X$ be the life in hours of a radio tube which is normally distributed with mean 20 and variance $\sigma$. If a purchaser of such a radio tubes requires that at least 90% of the tubes have life exceeding 150 hours then what is the largest value of standard deviation $\sigma$ for which the purchaser is still satisfied?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD

10) A component assumed to have exponential failure distribution [i.e., $X \sim \text{Exponential}()]$, was tested. The following life lengths (in hours) were observed: 100, 190, 170, 120, 180, 170, 200, 170, 160 and 140. Using the above sample values, obtain the ML estimate for the reliability of the component when used for a period of 150 hours. By reliability of the component we mean that it will survive for at least $t$ hours.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) TBD