

Unit 13 - Week 12

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Advanced Probability Theory (Lec29)

Advanced Probability Theory (Lec30)

Quiz : Assignment 12

Week 12 Feedback Form

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Assignment Solution

Assignment 12

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

Due on 2020-04-22, 23:59 IST.

1) There are 100 people on a plane. Let X_i be the weight (in kgs) of the i^{th} person on the plane. Suppose that the X_i 's are i.i.d., and $E(X_i) = \mu = 67$ and $\sigma_{X_i} = \sigma = 3$. Find the probability(p) that the total weight of the men on the plane exceeds 68,00 kgs. 1 point

- $p = 1 - \Phi\left(\frac{8}{3}\right)$
 $p = \Phi\left(\frac{8}{3}\right)$
 $p = 1 - \Phi\left(\frac{10}{3}\right)$
 $p = \Phi\left(\frac{10}{3}\right)$

No, the answer is incorrect. Score: 0

Accepted Answers:
 $p = 1 - \Phi\left(\frac{10}{3}\right)$

2) The average age of cricket players is 28.3 years and has a standard deviation of 2.3 years. If we can assume that ages are Normally distributed, what is the probability that the average age of 10 randomly selected players is less than 27 years? 1 point

- $\Phi(-1.79)$
 $1 - \Phi(1.79)$
 $\Phi(0.57)$
 $\Phi(-0.57)$

No, the answer is incorrect. Score: 0

Accepted Answers:
 $\Phi(-1.79)$
 $1 - \Phi(1.79)$

3) The length of time, in hours, taken by a group of people to play one golf match is normally distributed with a mean of 2 hours and a standard deviation of 0.5 hours. A sample of size $n = 50$ is drawn randomly from the population. What is the probability that the sample mean is between 1.8 hours and 2.3 hours. 1 point

- 0.95
 0.92
 0.90
 0.99

No, the answer is incorrect. Score: 0

Accepted Answers:
0.99

4) Preeti invites 64 guests to a tea party. She believes that a guest will have 0, 1 or 2 cups of tea with probabilities $\frac{1}{4}, \frac{1}{2}$ and $\frac{1}{4}$ respectively. How many cups she should make to be 95% sure that there is no shortage? (Assume that amount of tea each guest drinks is independent of other guests) 1 point

- 70
 71
 73
 76

No, the answer is incorrect. Score: 0

Accepted Answers:
73

5) Let X_1, X_2, \dots, X_n be i.i.d random variables such that each $X_i \sim \text{Exp}(1)$. What is the smallest n be such that for $Y = X_1 + X_2 + \dots + X_n$ 1 point

$$P\left(0.9 \leq \frac{Y}{n} \leq 1.1\right) \geq 0.95$$

- 365
 385
 415
 425

No, the answer is incorrect. Score: 0

Accepted Answers:
385

6) Suppose that you have a sample of 100 values from a population with mean $\mu = 500$ and with standard deviation $\sigma = 80$. What is the probability that the sample mean will be in the interval (490, 510)? 1 point

- 0.99
 0.89
 0.79
 0.69

No, the answer is incorrect. Score: 0

Accepted Answers:
0.79

7) Suppose the age of cars on the road is Normally distributed with a mean of 7.2 years. If the standard deviation is known to be 2.1 years, what is the probability that 12 randomly selected cars have been on road for between 6 and 8 years? 1 point

- 0.9
 0.7
 0.5
 0.3

No, the answer is incorrect. Score: 0

Accepted Answers:
0.9

8) The amount of regular petrol purchased every week at a petrol pump near QutubMinar follows the normal distribution with mean 50000 litres and standard deviation 10000 litres. The starting stock of petrol is 74000 litres, and there is a scheduled weekly delivery of 47000 litres. What is the probability that, after 11 weeks, the stock of petrol will be below 20000 litres? 1 point

- 0.56
 0.46
 0.36
 0.26

No, the answer is incorrect. Score: 0

Accepted Answers:
0.26

9) Suppose that the time required for a glass blower to make glass sculpture of a peacock is a random variable with mean 1 hour and standard deviation 0.4 hours. He receives an order of 100 peacock sculptures. What is the probability that he takes more than 110 hours to complete the order? (Correct upto two decimal places) 1 point

- 0.08
 0.06
 0.03
 0.01

No, the answer is incorrect. Score: 0

Accepted Answers:
0.01

10) Video projector light bulbs have a mean lifetime of $\mu = 100$ hours and standard deviation $\sigma = 75$. A college uses the projectors for 9000 hours per semester. How likely it is that 100 light bulbs will be sufficient for the semester? 1 point

- 45%
 61%
 75%
 91%

No, the answer is incorrect. Score: 0

Accepted Answers:
91%