

Unit 7 - Week 5

Course outline

How does an NPTEL online course work?

Practice Assignment

Week 1

Week 2

Week 3

Week 4

Week 5

- Lecture 37: Probability distributions
- Lecture 38: Properties of probability distributions
- Lecture 39: Bernoulli trials and binomial distributions
- Lecture 40: Atom probe technique and negative binomial distribution
- Lecture 41: Atom probe and hypergeometric distribution
- Lecture 42: Atom probe : analysis of error
- Lecture 43: Nucleation and Poisson distribution
- Lecture 44: Normal distribution
- Lecture 45: Normal distribution and error function
- Lecture 46: Probability scale

Download Videos

Weekly Feedback

Quiz : Assignment 5

Assignment 5 solution

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Text Transcripts

Assignment 5

The due date for submitting this assignment has passed. **Due on 2020-03-04, 23:59 IST.**
 As per our records you have not submitted this assignment.

1) Suppose N random trials are conducted and the outcome of each trial is either a "success" or a "failure". Which of the following distributions describes the number of successes in such trials? **1 point**

- Negative Binomial distribution
- Binomial distribution
- Uniform distribution
- Exponential distribution

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

2) Let the joint probability mass function of the random variables X and Y be defined as follows **1 point**

$p(0,0) = 0.2$, $p(0,1) = 0.4$, $p(1,0) = 0.3$, $p(1,1) = 0.1$. Then, the conditional probability mass function of X at Y = 1 is given by

- $\frac{1}{2}, \frac{1}{2}$
- $\frac{4}{3}, \frac{1}{5}$
- $\frac{1}{2}, \frac{1}{2}$
- $\frac{3}{5}, \frac{2}{5}$

No, the answer is incorrect.
 Score: 0
 Accepted Answers: $\frac{3}{5}, \frac{2}{5}$

3) In R, the density of binomial function is calculated using the command **1 point**

- pbinom()
- dnbinom()
- dbinom()
- rbinom()

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

4) In the course, we have discussed the Atom Probe technique and the distributions that result in the process - during the evaporation and detection of **1 point**

atoms. From the probed volume, let "m" atoms evaporate and hit the detector. The efficiency of detector is "Q" hence "n" atoms are detected. Using these values, the composition is estimated. The number of evaporated atoms "m" during the process before "n" atoms are detected at the detector follows which probability distribution?

- Negative Binomial distribution
- Binomial distribution
- Hypergeometric distribution
- Geometric distribution

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

5) The expression to calculate the probability distribution for "m" evaporated atoms before "n" atoms are detected by detector in the previous problem (Problem 4) is **1 point**

- $\frac{(1-Q)^m (1-Q)^n}{Q^{m+n}}$
- $\frac{(m-1)!}{(m-x)!(n-1)!} Q^n (1-Q)^{m-n}$
- $\frac{(m)!}{(n)!} Q^n (1-Q)^{m-n}$
- $\frac{(m)!}{(n)!} Q^n (1-Q)^m$

No, the answer is incorrect.
 Score: 0
 Accepted Answers: $\frac{(m-1)!}{(m-x)!(n-1)!} Q^n (1-Q)^{m-n}$

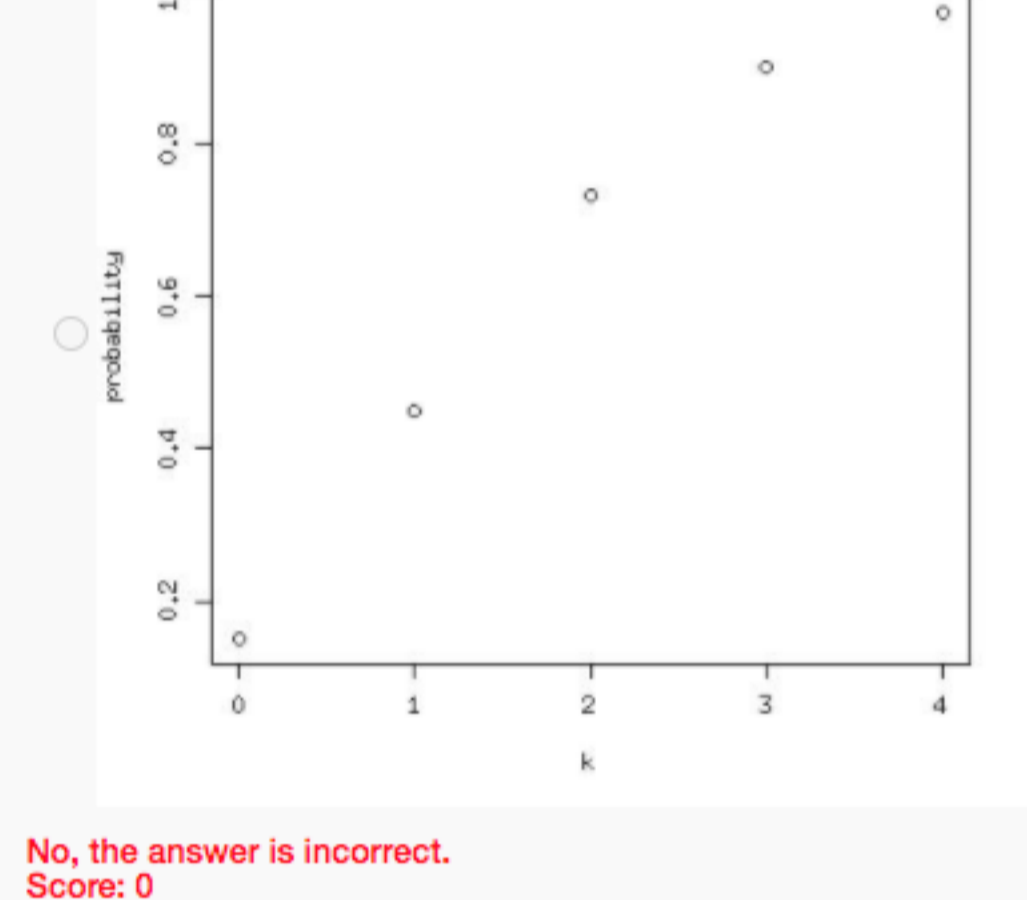
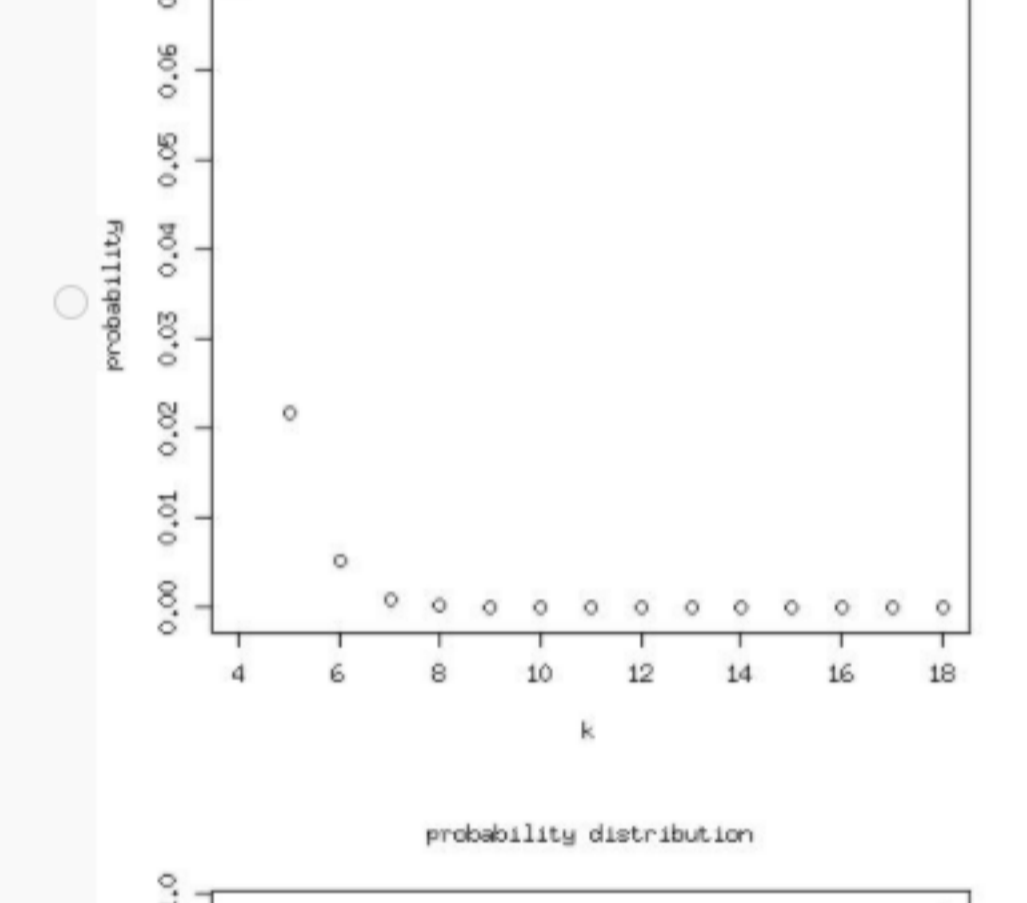
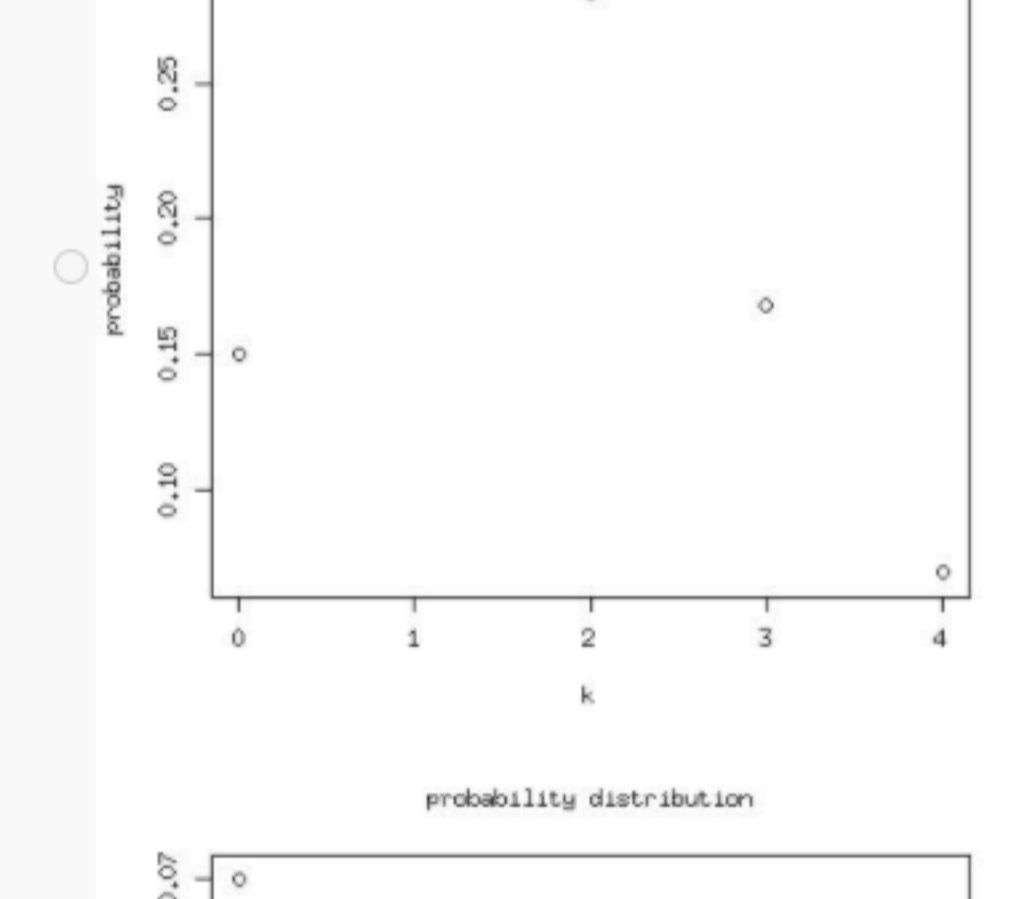
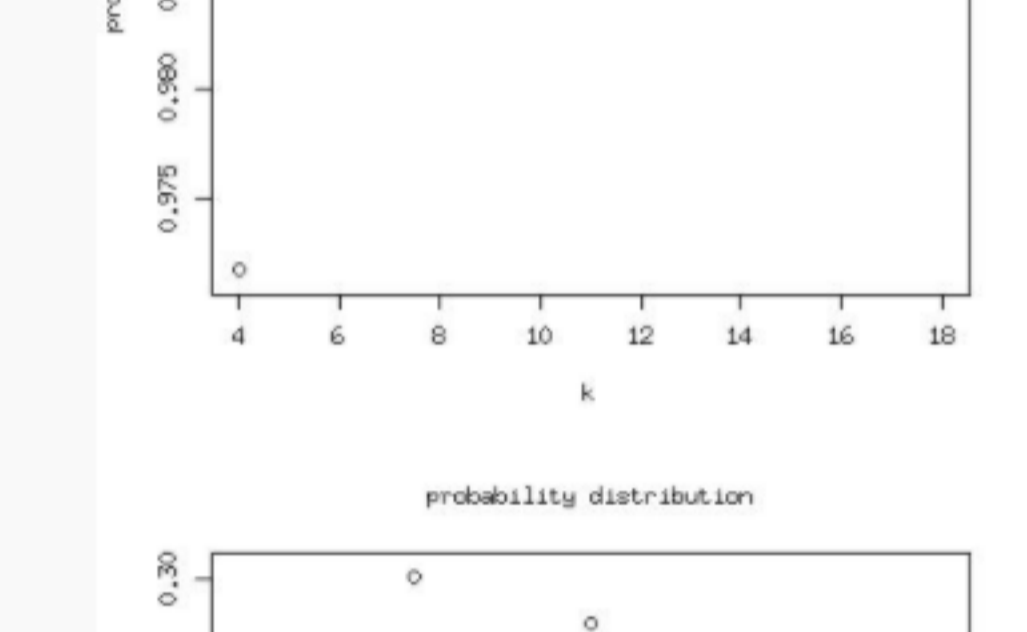
6) It is known that during manufacturing, the probability that a manufactured solar panel will be defective is 10%. Assume that the 18 solar panels are **1 point**

randomly chosen; assume that these are independent samples; we want to calculate the probability that out of these 18 samples 4 or more samples are defective. Which of the following code snippets will give the answer?

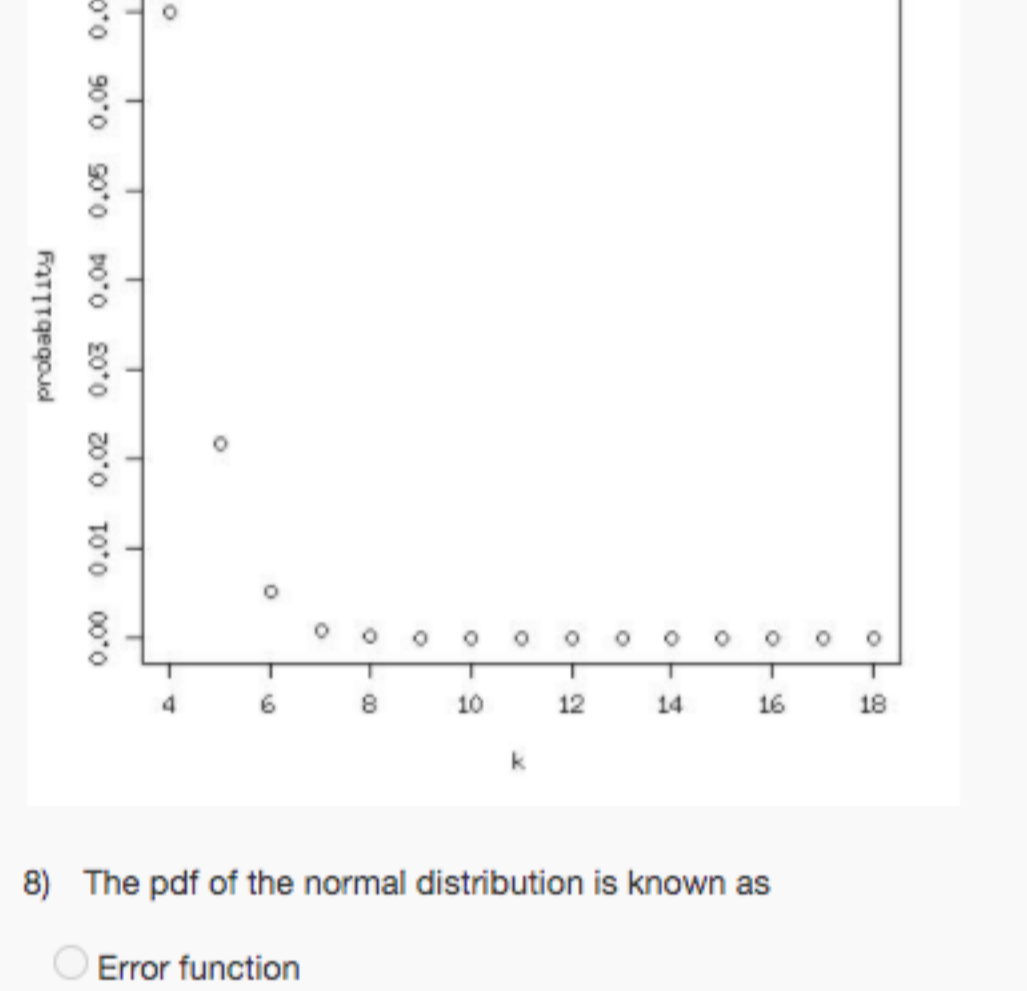
- sum(dbinom(4:18,18,0.1))
- sum(dbinom(0:18,18,0.1))
- 1-sum(dbinom(0:7,18,0.1))
- 1-sum(dbinom(0:3,18,0.1))

No, the answer is incorrect.
 Score: 0
 Accepted Answers: sum(dbinom(4:18,18,0.1))
 1-sum(dbinom(0:3,18,0.1))

7) Consider the problem described in the previous question (Question 6). Which of the following plots gives the probability distribution for 4 more **1 point**



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



8) The pdf of the normal distribution is known as **1 point**

- Error function
- Gaussian
- Hypergeometric distribution
- Bernoulli trial

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

9) The error function is related to **1 point**

- pdf of Poisson distribution
- cdf of Poisson distribution
- cdf of standard normal distribution
- pdf of negative binomial distribution

No, the answer is incorrect.
 Score: 0
 Accepted Answers: cdf of standard normal distribution

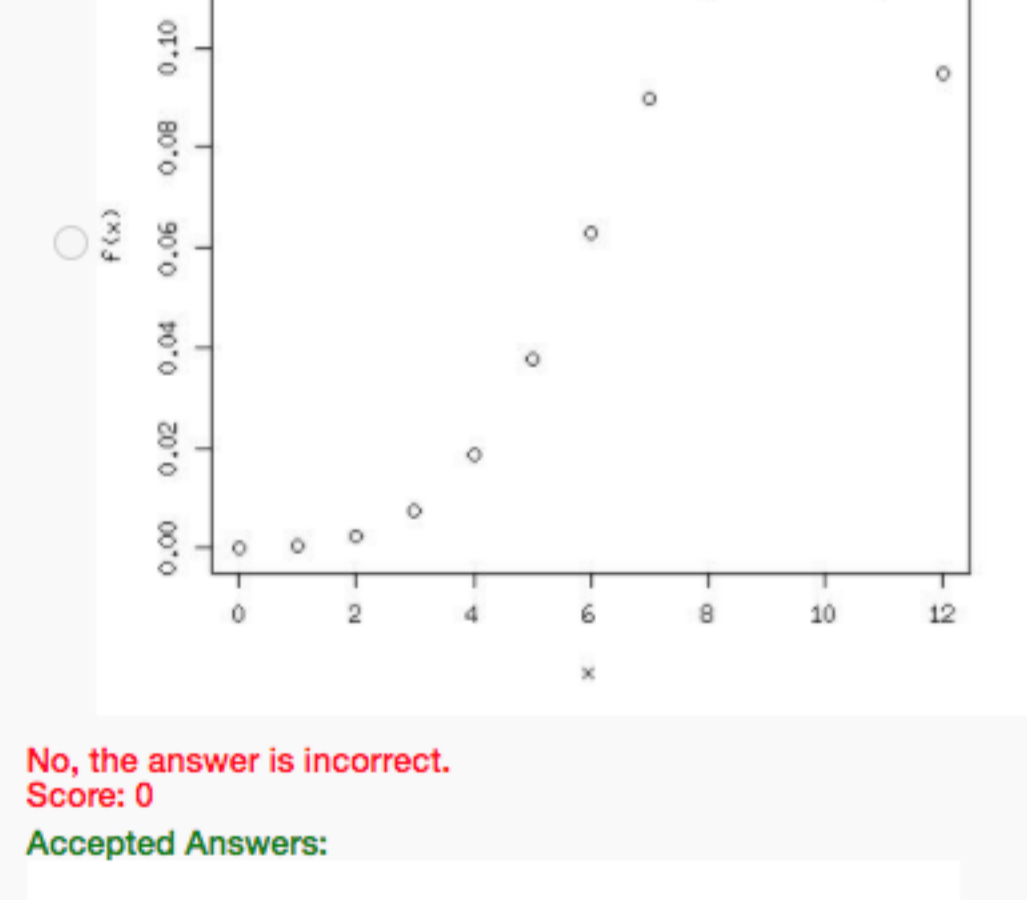
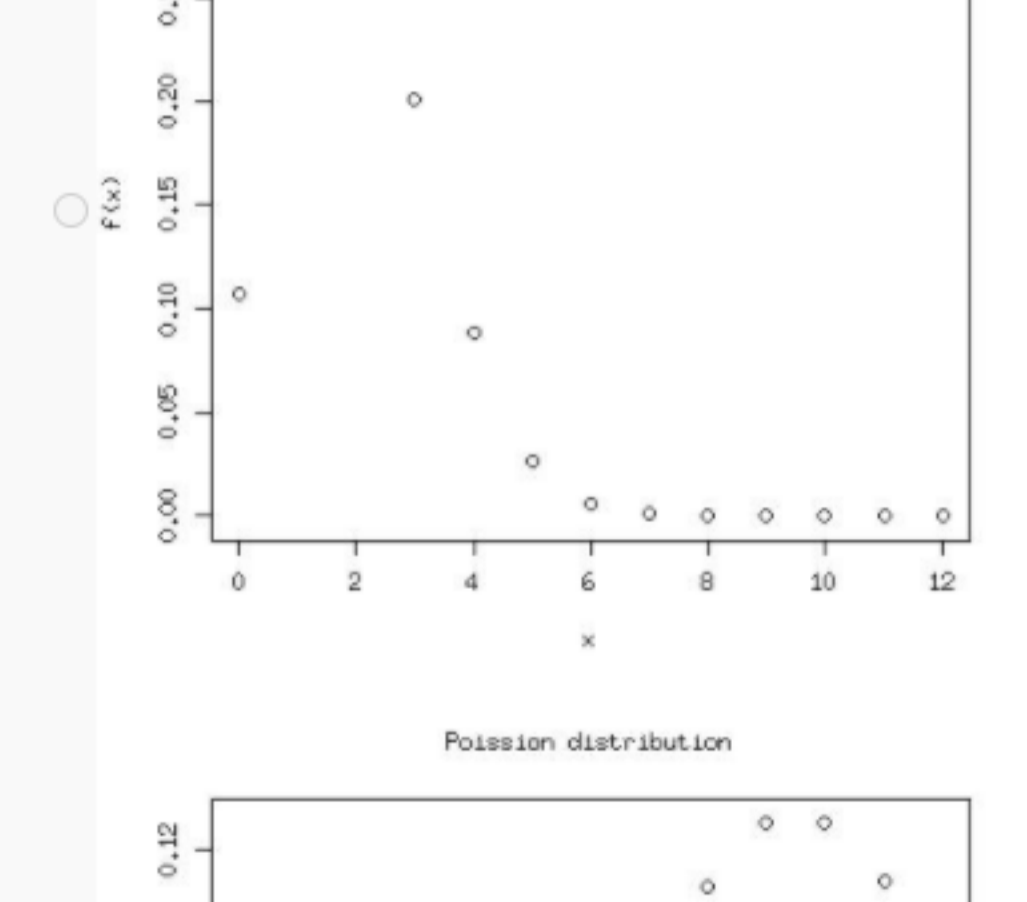
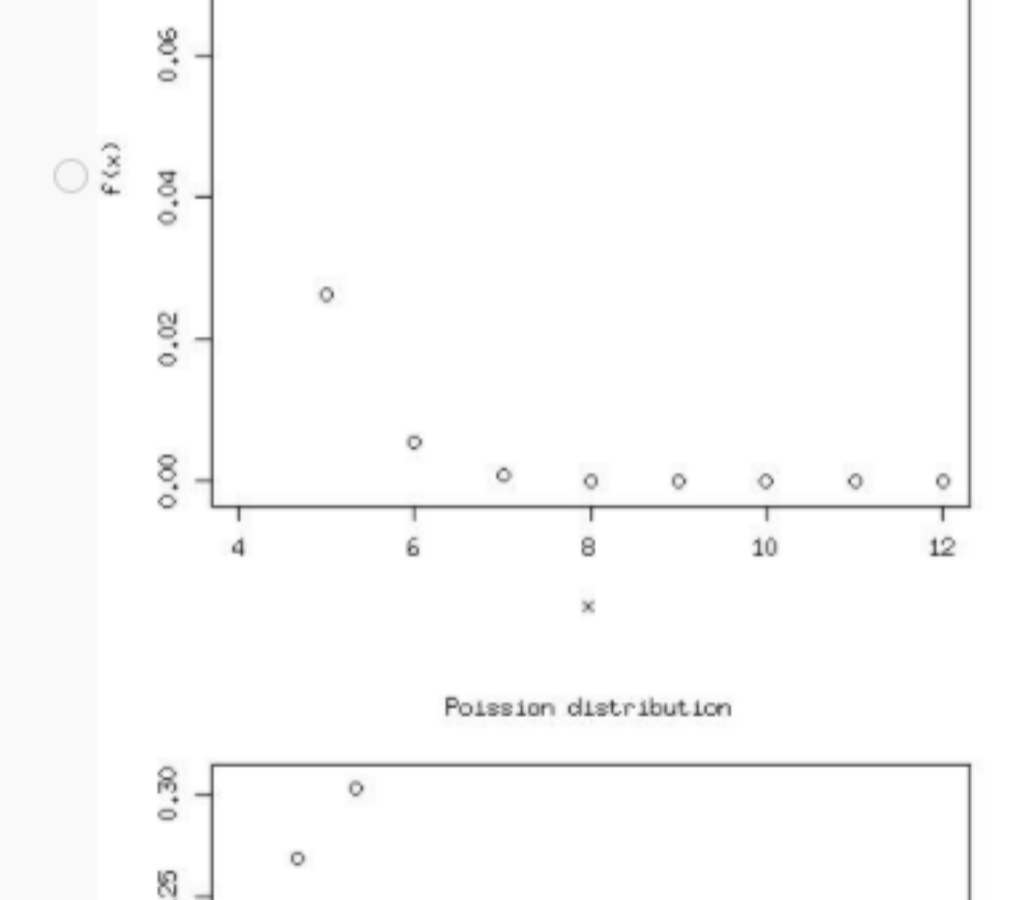
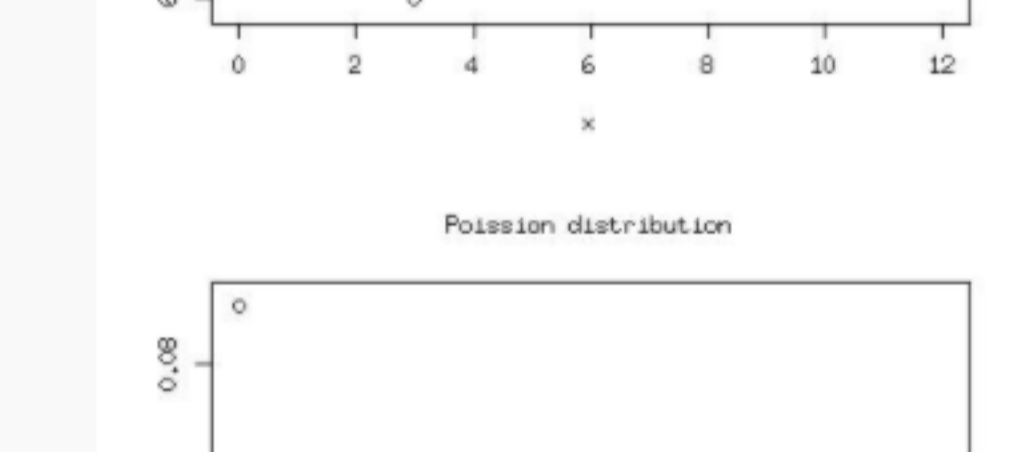
10) Let F be a cumulative distribution function. If F(x) = q, x is known as **1 point**

- Median
- Skewness
- q-th quantile
- kurtosis

No, the answer is incorrect.
 Score: 0
 Accepted Answers: q-th quantile

11) Pore processes is a problem in casting contains 0.1 average pores per square centimetre that it follows Poisson distribution. The front axle hub of a **1 point**

heavy duty vehicle manufactured by casting contains 0.1 average pores per square centimetre of the surface. Considering an area under study of 100 square centimetres, the Poisson distribution of the pores, for an occurrence of 12 pores in the area under study is plotted. Which of the following figures is corresponds to the plot?



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

