Question 1
Answer saved
Marked out of 1.00

Let X be the random variable with probability density function $f(x)=\begin{cases}2x, & \text{for } 0<x<1\\ 0, & \text{otherwise}\end{cases}$.

Find the expected value of Y = 2X – 3.

- a. -4/3
- b. None of these
- c. 2/3
- d. -5/3
- e. 4/3

Clear my choice

Question 2
Answer saved
Marked out of 1.00

A random sample of 150 students has a grade point average with a mean of 2.86 and with a standard deviation of 0.78. Construct the confidence interval for the population mean, μ, if α = 0.02. Let z_0.01 =2.33; z_0.02 =2.05; t_0.01,149 =2.35; t_0.02,149 =2.07.

- a. (2.31, 3.88)
- b. (2.43, 3.79)
- c. (2.51, 3.53)
- d. (2.71, 3.01)
- e. None of the other choices is correct

Clear my choice

Question 3
Answer saved
Marked out of 1.00

The standard IQ test has a mean of 97 and a standard deviation of 10. We want to be 95% certain that we are within 5 IQ points of the true mean. Determine the required sample size.
Given $z_{0.05} = 1.645$, $z_{0.025} = 1.96$.

- a. 17
- b. 25
- c. None of these
- d. 16
- e. 15

Clear my choice

Question 4
Answer saved
Marked out of 1.00

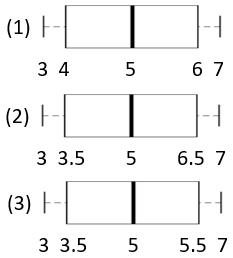
If the population correlation between two variables is determined to be -0.85, which of the following is known to be true?

- a. An increase in one variable will cause the other variable to decline by 85 percent.
- b. There is a fairly strong negative linear relationship between the two variables.
- c. There is a positive linear relationship between the two variables.

Clear my choice

Question 5
Answer saved
Marked out of 1.00

Construct the boxplot of the data: 3, 4, 6, 7



- a. None of these
- b. (3)
- c. (2)
- d. (1)

Clear my choice

Question 6
Answer saved
Marked out of 1.00

An electronics company manufactures resistors that have a mean resistance of 100 ohms and $\sigma^2 = 15^2$. A sample of 25 resistors is selected at random.

Find the **standard deviation** of the sample mean.

- a. 4
- b. 3
- c. 0.6
- d. None of these
- e. 9

Clear my choice

Question 7
Answer saved
Marked out of 1.00

Given a sample of MAS291-marks of FPT students on 1-100 scale:

41 45 47 47 53 53 65 69 69 69

Construct a **steam-and-leaf** diagram for this data.

Select one.

(1)
```
4 | 1 5 7
5 | 3
6 | 5 9
```

(2)
```
4 | 1 5 7 7
5 | 3 3
6 | 5 9 9 9
```

(3)
```
4 | 1 5 7
5 | 3 3
6 | 5 9 9
```

- a. (3)
- b. None of these
- c. (2)
- d. (1)

Clear my choice

Question 8
Answer saved
Marked out of 1.00

In a linear regression model, the quantity $\sum_{i=1}^{n}\left(y_i-\bar{y}\right)^2$ is called ____

- a. total sum of squares
- b. error sum of squares
- c. None of these
- d. regression sum of squares

Clear my choice

Question 9
Answer saved
Marked out of 1.00

A random sample of 51 observations was made on the diameter of spot welds and the corresponding weld shear strength. Given that r = 0.4, find the test statistic for the hypothesis that ρ = 0, using α = 0.01.

- a. 4.76
- b. None of these
- c. 4.67
- d. 3.33
- e. 3.06

Clear my choice

Question 10
Answer saved
Marked out of 1.00

Suppose A = B, find P(A|B).

- a. 0.5
- b. 1
- c. 0

Clear my choice

Question 11
Answer saved
Marked out of 1.00

The exam grades on 0-10 scale for 6 randomly selected students taking a course in engineering statistics and and a course in operating system are given below.
Assume that the exam grades are jointly normally distributed.

Statistic:	5.6	4.5	4.9	4.5	7.0	7.4
OS:	5.0	5.1	5.5	5.1	7.2	7.5

Estimate the correlation coefficient.

- a. 0.86
- b. 0.14
- c. 0.73
- d. None of these
- e. 0.93

Clear my choice

Question 12
Answer saved
Marked out of 1.00

The fields of descriptive statistical do NOT contain ___

- a. Identification of patterns in the data.
- b. Inference about the population based on the sample.

Clear my choice

Question 13
Answer saved
Marked out of 1.00

Given $P(A \cap B) = 0.3, P(A \mid B) = 0.5$. Find $P(B)$.

- a. 0.2
- b. 0.8
- c. 0.6
- d. Not enough information to know.

Clear my choice

Question **14**
Answer saved
Marked out of 1.00

Events A and B are mutually exclusive. Suppose P(A) = 0.3 and P(B) = 0.5, find $\mathrm{P}(A \cap B)$ and $P(A \cup B)$.

- a. 0, 0.15
- b. 0, 0.8
- c. None of these
- d. 0.15, 0.65
- e. 0.15, 0.8

Clear my choice

Question **15**
Answer saved
Marked out of 1.00

According to a survey, the probability that the residents of a city own 2 houses if annual income is over $3,000 is 0.7. Of all residents in the survey, 50% had incomes over $3,000 and 60% had 2 houses. The probability that the residents own 2 houses and have an income over $3,000 a year is

- a. None of these
- b. 0.71
- c. 0.35
- d. 0.42
- e. 0.3

Clear my choice

Question **16**
Answer saved
Marked out of 1.00

You pick two books without replacement from shelf of 5 math books and 7 history books. Find the probability that the first book is a math book and the second book is a history book.
Round your answer to three decimal places.

- a. 0.033
- b. 0.029
- c. 0.243
- d. None of these
- e. 0.265

Clear my choice

Question 17
Answer saved
Marked out of 1.00

Some fields in statistics:

- a. the collection, presentation, analysis and use of data to make decisions, solve problems.
- b. quantifying the risks involed in decisions made every day.

Clear my choice

Question 18
Answer saved
Marked out of 1.00

What is a method of collecting data?

- a. All of the others.
- b. A undesigned experiment.
- c. A retrospective study using historical data.
- d. A case study.

Clear my choice

Question 19
Answer saved
Marked out of 1.00

Suppose that 4% of people are color blind. If 5 people are selected at random, what is the probability that exactly 2 of them are color blind?

- a. 0.0283
- b. 0.0006
- c. 0.0014
- d. None of these
- e. 0.0142

Clear my choice

Question 20
Answer saved
Marked out of 1.00

If $f(x)=\frac{1}{2^x}, x=1,2,3,...$ is a probability mass function, find the value of the cumulative distribution function F(3).

- a. 7/8
- b. 2/3
- c. 3/4
- d. 5/8
- e. None of these

Clear my choice

Question 21
Answer saved
Marked out of 1.00

In a recent survey, 60% of the community favored building a supermarket in their neighborhood. If 25 citizens are chosen, what is the **variance** of the number favoring the supermarket?

- a. 7
- b. 9
- c. 8
- d. 6

Clear my choice

Question 22
Answer saved
Marked out of 1.00

Let the random variable X have a discrete **uniform distribution** on integer from 3 to 8.
Compute P(X > 6).

- a. 2/3
- b. 1/2
- c. 1/4
- d. 1/3
- e. None of these

Clear my choice

Question 23
Answer saved
Marked out of 1.00

A trading company uses eight computers to trade on the New York Stock Exchange (NYSE). The probability of a computer failing in a day is 0.005, and the computers fail independently. Computers are repaired in the evening, and each day is an independent trial.

What is the mean number of days until all eight computers fail on the same day?

- a. 500
- b. None of these
- c. 4000
- d. 1600
- e. 1400

Clear my choice

Question 24
Answer saved
Marked out of 1.00

Suppose that X has a Poisson distribution with a mean of 0.4. Find P(X = 2).

- a. 0.033
- b. 0.054
- c. 0.06
- d. 0.012
- e. None of these

Clear my choice

Question 25
Answer saved
Marked out of 1.00

A probability density function of X is given by $f(x)=\frac{2}{x^2}, x \in [1, 2]$. Find the probability that X is between 1 and 3/2.

- a. 2/3
- b. 1/2
- c. None of these
- d. 1/4
- e. 1/3

Clear my choice

Question **26**
Answer saved
Marked out of 1.00

Given the cumulative distribution function $F(x)=\begin{cases}0, & \text{if } x<0\\ \dfrac{1}{1+e^{-x}}, & \text{if } x\geq 0\end{cases}$.

Find $P[3<X<\infty]$.

- a. 0.12
- b. 0.27
- c. None of these
- d. 0.047

Clear my choice

Question **27**
Answer saved
Marked out of 1.00

A sample of 2 different iPhones is randomly selected from box of 8 defective iPhones and 42 good ones. What is the probability that all two of the iPhones selected are defective?

- a. 0.0224
- b. None of these
- c. 0.0229
- d. 0.0130
- e. 0.0128

Clear my choice

Question **28**
Answer saved
Marked out of 1.00

Given two independent events A, B such that P(A) = 0.7, P(B) = 0.4.
$P(A\cup B)$.

- a. None of these
- b. 0.82
- c. 0.28
- d. 0.3
- e. 1.1

Clear my choice

Question 29
Answer saved
Marked out of 1.00

On a final exam of 50 multiple choice questions, each question has four possible answers, one of which is correct. Suppose students answer questions at random, find the mean for the random variable X, the number of correct answers.

- a. 12.5
- b. 15
- c. 14
- d. 20

Clear my choice

Question 30
Answer saved
Marked out of 1.00

The number of e-mail messages received per hour has the following distribution:

x = number of messages	10	11	12	13	14	15
$f(x)$	0.08	0.15	0.30	0.20	0.20	0.07

Determine the variance of the number of messages received per hour.

- a. 1.36
- b. 1.85
- c. 2.05
- d. None of these
- e. 1.47

Clear my choice

Question 31
Answer saved
Marked out of 1.00

Based upon past experience, 40% of all customers at a service pay for their purchases with a credit card. If a random sample of 200 customers is selected, what is the approximate probability that at least 75 pay with a credit card?

Let P(Z < -0.79) = 0.215; P(Z<-0.65) = 0.258

- a. 0.742
- b. 0.145
- c. 0.785
- d. None of these
- e. 0.473

Clear my choice

Question 32
Answer saved
Marked out of 1.00

The sample space of a random experiment is

$$\{0, 1, 2, 3, 4, 5, 6\}$$

with probabilities

$$0.10,\ 0.15,\ 0.20,\ 0.25,\ 0.20,\ 0.06, 0.04,\ \text{respectively.}$$

Let A denote the event $\{0, 1, 3, 5\}$ and let B denote the event $\{1, 4, 5, 6\}$. Determine $P(A \cap B)$.

- a. 0.16
- b. 0.21
- c. 0.85
- d. 0.35
- e. None of these

Clear my choice

Question 33
Answer saved
Marked out of 1.00

A software program has 5000 lines of code. Denote by X the number of lines with a fatal error. Determine the possible values of the random variable X.

- a. {1, 2, 3, ..., 4998}
- b. {1, 2, 3, ..., 5000}
- c. {2, 3, ..., 5000}
- d. None of these
- e. {0, 1, 2, ..., 5000}

Clear my choice

Question **34**
Answer saved
Marked out of 1.00

Let the random variable X have a discrete uniform distribution on integer from 30 to 89. Determine P(X > 47).
Round to two decimal places.

- a. 0.68
- b. 0.85
- c. None of these
- d. 0.70
- e. 0.81

Clear my choice

Question **35**
Answer saved
Marked out of 1.00

Assume that a procedure yields a binomial distribution with a trial repeated n = 4 times. Use the binomial probability formula to find the probability of x=1 success given the probability p = 0.04 of success on a single trial.

Round to three decimal places.

- a. 0.091
- b. 0.142
- c. 0.139
- d. None of these
- e. 0.375

Clear my choice

Question **36**
Answer saved
Marked out of 1.00

You buy a package of 122 Smarties and 19 of them are red. Let z_0.05=1.64, z_0.025=1.96. What is a 95% confidence interval for the true proportion of red Smarties?

- a. (0.091, 0.220)
- b. (0.103, 0.230)
- c. (0.085, 0.199)
- d. None of these
- e. None of these

Clear my choice

Question **37**
Answer saved
Marked out of 1.00

What is $P(-z_{\alpha/2} < Z < z_{\alpha/2})$?

(i) $1-\alpha$ (ii) α (iii) $1-\frac{\alpha}{2}$

- a. (ii)
- b. (i)
- c. (iii)
- d. None of these

Clear my choice

Question **38**
Answer saved
Marked out of 1.00

To determine the difference (if any) between two brands, 18 products of each brand are tested. Assume that the lifetimes of both brands come from the same normal distribution $N\left(\mu, 200^2\right)$.

Compute $P\left(\overline{X}-\overline{Y}>100\right)$.

Given P(Z < 1.5) = 0.933, P(Z < 1.4) = 0.919

- a. 0.933
- b. None of these
- c. 0.081
- d. 0.067
- e. 0.919

Clear my choice

Question **39**
Answer saved
Marked out of 1.00

We measured the weight of 30 rats under experiment controls. Suppose that 9 were underweight rats. Let p be in population. What sample size is needed to be 95% confident that the error in estimating the true proportion of rats that are underweight is less than 10%? Using the point estimate of p obtained from this sample.

Given $z_{0.05}$ = 1.64 , $z_{0.025}$ = 1.96

- a. 81
- b. 56
- c. 80
- d. None of these
- e. 57

Clear my choice

Question 40
Answer saved
Marked out of 1.00

Let X be a random variable with the probability density function f(x) = 2x when 0 < x < 1.
What is the variance of X?

- a. None of these
- b. 3/9
- c. 2/9
- d. 1/18
- e. 1/9

Clear my choice

Question 41
Answer saved
Marked out of 1.00

At FPT University, marks of MAS291-students on final exams are normally distributed with a mean of 4.7 and a standard deviation of 0.6. What percentage of students at FPT have marks between 3 and 3.9?
Let P(Z< -2.83) = 0.0023, P(Z < -1.33) = 0.0918, P(Z < -1.53) = 0.0630

- a. 6.5%
- b. 4%
- c. None of these
- d. 2.88%
- e. 8.95%

Clear my choice

Question 42
Answer saved
Marked out of 1.00

Which of the following statements is false?

(i) If $(X_1, X_2,..., X_n)$ is a random sample of size n, the sample standard deviation S is not a statistic.

(ii) The probability distribution of a statistic is called a sampling distribution.

(iii) A statistic is any function of the observations in a random sample.

(iv) The sampling distribution of a statistic does not depend on the distribution of the population.

a. (i), (ii)
b. (i), (iv)
c. (iii), (iv)
d. (ii), (iv)

Clear my choice

Question 43
Answer saved
Marked out of 1.00

The following data represents the high ambient temperature for a particular city over the past 16 days.

52	56	56	58	59	60	62	65
69	73	73	74	76	76	77	78

Construct a stem and leaf display for this data.

(i)

5	26689
6	0259
7	3346678

(ii)

5	26689
6	02599
7	3346778

(iii)

5	22669
6	0259
7	346778

a. (iii)
b. (i)
c. (ii)

Clear my choice

Question 44
Answer saved
Marked out of 1.00

Suppose you and a friend each choose at random an integer between 1 and 8, where your number is written first and your friend's number second. Which the following statement is TRUE?

- a. All of the these
- b. P (you pick 5 and your friend picks 8) = 1/64
- c. P (both numbers match) = 8/64
- d. P (sum of the two numbers picked is < 4) = 3/64

Clear my choice

Question 45
Answer saved
Marked out of 1.00

A normal population has a mean of 36 and a variance of 9. How large must be the random sample be if we want the standard error of the sample mean to be 0.4?

- a. 57
- b. 45
- c. None of these
- d. 47
- e. 36

Clear my choice

Question 46
Answer saved
Marked out of 1.00

It is desired to estimate the average age of CEOs in the Service industry. Data were randomly collected from 30 CEOs and the 97% confidence interval was calculated to be (34, 49). Which of the following interpretations is correct?

- a. None of these
- b. We are 97% confident that the average age of all CEOs in the Service industry falls in the interval 34 to 49. 7536180
- c. In the population of Service industry CEOs, 97% of them will have ages that fall in the interval 34 to 49.
- d. We are 97% confident that the mean of the sampled CEOs falls in the interval 34 to 49.
- e. 97% of the sampled ages fell between 34 and 49

Clear my choice

Question 47

Answer saved

Marked out of 1.00

In a random sample of 49 smartphones, the mean repair cost was $35 with a population standard deviation of 12. Construct a 99% confidence interval for the population mean.

Round the result to two decimal places.

Let

$$z_{0.01} = 2.326,\ z_{0.005} = 2.576,$$
$$t_{0.01,59} = 2.662,\ t_{0.005,59} = 2.916$$

- a. None of these
- b. (31.13, 38.87)
- c. (30.00, 34.00)
- d. (31.17, 38.83)
- e. (30.44, 39.56)

Clear my choice

Question 48

Answer saved

Marked out of 1.00

Consider the data

x (hours):	3	4	5	6	7
y (marks):	5.2	6	6.2	5	6.5

Use sample correlation coefficient to give an estimate for ρ , the correlation coefficient.

- a. 0.27
- b. 0.39
- c. None of these
- d. 0.15

Clear my choice

Question **49**

Answer saved

Marked out of 1.00

The mean of GPAs of 25 students is 4.3. Assuming that $\sigma = 0.7$.
Find the test statistic and test the hypothesis that the population mean GPA is 5. Use a 0.05 significance level.

Let $z_{0.05} = 1.65$, $z_{0.025} = 1.96$

- a. Test statistic $z_0 = -2.5$. There is NO sufficient evidence to reject the hypothesis that the population mean GPA is 5.
- b. None of these
- c. Test statistic $z_0 = -2.5$. There is sufficient evidence to reject the hypothesis that the population mean GPA is 5.
- d. Test statistic $z_0 = -5$. There is NO sufficient evidence to reject the hypothesis that the population mean GPA is 5.
- e. Test statistic $z_0 = -5$. There is sufficient evidence to reject the hypothesis that the population mean GPA is 5.

Clear my choice

Question **50**

Answer saved

Marked out of 1.00

From a normally distributed population, we collect a sample of five observations with sample mean of 15.5 and sample standard deviation of 2.3.
Test the hypothesis: $H_0 : \mu = 14$ vs $H_1 : \mu \neq 14$ using $\alpha = 0.05$

Let
$z_{0.05} = 1.645, z_{0.025} = 1.96, t_{0.025,4} = 2.776, t_{0.05,4} = 2.132,$
$t_{0.025,5} = 2.571, t_{0.05,5} = 2.0$

- a. Test statistic = 2.41, reject H_0.
- b. Test statistic = 1.46, reject H_0.
- c. Test statistic = 1.46, do not reject H_0.
- d. None of these
- e. Test statistic = 2.41, do not reject H_0.

Clear my choice

« »