CS154 Endsem

Class: B. Tech. (CSE)
Year: First
Semester: Second
Subject: Mathematics - II (Probability and Statistics)
Subject Code: CS154
Exam: End semester Exam
Marks: 40
Date: 13/7/2021 (Tuesday)
Time: 10:00 am to 11:30 am
Duration: 90 Minutes

For any queries, contact your teacher.

Hi 20124051@nuv.ac.in, when you submit this form, the owner will be able to see your name and email address.

* Required

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2

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3

Suppose that the weights of the 500 people of town represents a random sample of these weights of all 1600 people in the town. The mean and the variance of sample weights is 68 kg and 8 kg respectively. Find a 95% confidence interval for the population mean.
(2 Points)

(67.3, 68.7)

4

$$(a) P(A \cap B) = P(A) \cdot P(B)$$
$$(b) P(A|B) = P(A)$$
$$(c) P(B|A) = P(B)$$
$$(d) P(A \cup B) = P(A) + P(B)$$

Consider these 4 statements (a) to (d) for two independent events A and B. Select most appropriate option.
(1 Point)

- (●) Statements (a), (b) and (c) are true
- ( ) All Statements are true
- ( ) None of them is true
- ( ) Statements (b) and (c) are true
- ( ) Statements (b), (c) and (d) are true
- ( ) Statements (a) and (d) are true

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An urn contains red and white marbles in an unknown proportion. A random sample of 60 marbles selected with replacement from the urn showed that 70% were red. Find the 99% confidence interval for the population proportion of red marbles in the urn.
(2 Points)

(0.547, 0.853)

6

In some survey, the data is collected and on the basis of first few samples, we choose other samples. Which type of sampling is it?
(1 Point)

- Snowball sampling
- Purposive sampling
- Quota sampling
- Convenience sampling

7

List out all the parameters and statistics in the following problem:

"In the past the standard deviation of weights of certain 40.0 ounce packages filled by a machine was 0.25 ounce. A random sample of 20 packages showed a standard deviation of 0.32 Ounce."
(2 Points)

1)A random sample of 20 packages showed a standard deviation of 0.32 Ounce.- Statistics 2

8

The following table give the ages (in years) of husbands and wives for six couples. Find the Karl Pearson's Correlation Coefficient.
(2 Points)

Husband's age	43	57	28	19	3
Wife's age	37	51	32	20	3

0.9745

9

A review of COVID-19 emergency room records at Sayaji Hospital was performed on 1st May 2021 to determine the probability distribution of the number of COVID-19 patients entering the emergency room during a 1-hour period. The following table lists the distribution.

Determine the probability that the number of COVID-19 patients entering the COVID-19 emergency room during a randomly selected 1-hour period is at least 3.
(1 Point)

Patients per hour	0	1	2	3	4
Probability	.2725	.3543	.2303	.0998	.0324

0.1429

10

A population consists of 5 values 8, 2, 3, 4, 5 and 6. Consider all samples of size 2 which are drawn with replacement from this population. Find the variance of the sampling distributions of mean.
(2 Points)

3.889

11

Fit a straight line on following data using Method of least squares. Find value of y for x=3.5 in the box given below.
First write a straight line in the box given below.
Then put a comma and write value of y at x=3.5.
(2 Points)

x	1	1.5	2.7	3
y	2	2.9	4.3	4.9

y=1.319x+0.8005,5.417

12

Suppose x and y are two variables. Then determine line of regression y on x given the following information.

(2 Points)

$\bar{x} = 20,\ \bar{y} = 45,\ b_{yx} = 4,\ bxy = \frac{1}{9}.$

$y = 4x - 35$

13

Let X be a random variable following a normal distribution with mean 0.8 and standard deviation 2. Then find the following probability:
(2 Points)

$P\,(X \leq 2.44)$

Enter your answer

14

Consider a random experiment of tossing two coins. Suppose A be the event that "at least one head obtained" and Suppose B be event "the second coin gives tails." Then what will be B-A ?
(1 Point)

1

15

Write the range of the Karl Pearson's correlation coefficient.
(1 Point)

-1 to +1

16

"The mean height of all the NUV students is 164 cm. A sample of 200 students is selected and the mean height of sample of students was found to be 168.8 cm."
Consider following two statements and Select the most appropriate option from the below:
(1 Point)

(1) The mean height of all the NUV students (i.e. 164 cm) is a statistics.
(2) The mean height of sample of 200 students (i.e. 168.8 cm) is a parameter.

- (●) Neither the statement (1) nor (2) are true.
- ( ) Only statement (2) is true.
- ( ) Only statement (1) is true.
- ( ) Statement (1) and (2) are true.

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Suppose that the population standard deviation is 20. The sample mean, of sample of size 100, is 135. Determine 95% confidence interval for population mean.
(2 Points)

(0.9691,0.9309)

18

Consider a random experiment of throwing two dice. Let A be the event that "the product of numbers obtained on two dice is a prime number". How many elements are there in event A?
(1 Point)

(1 Point)

- 7
- 14
- None of the other 7 options
- 15
- 11
- 18
- 36
- 6

19

An estimate of population parameter given by two numbers between which a parameter may lie is called _____ of the parameter.
(1 Point)

- Interval estimate
- Point estimate
- None of the other 3 options
- Estimator

20

Determine the line of regression x on y from the following data:
(2 Points)

x	1	2	3	4
y	2.9	6.8	4.4	8.3

x=0.3542y+0.4923

21

It has been found that 5% of the 600 students failed in an examination. Find variance of the sample proportions.
(2 Points)

0.0417

22

Consider a following situation and identify which non-probability sampling method is used in this situation.
"Nation Plus News decides to conduct an opinion poll. They ask viewers to participate in an opinion poll. Some viewers participated in this."
(1 Point)

Voluntary Response Sampling

23

"The population is divided into groups, and then any one group is is selected using simple random sampling."

selected using simple random sampling.
Which type of sampling method is this?
(1 Point)

- Cluster sampling
- Quota sampling
- Stratified sampling
- Simple random sampling

24

$$P(B_1) = 0.6, P(B_2) = 0.3, P(B_3) = 0.10$$
$$P(A|B_1) = 0.09, P(A|B_2) = 0.20, P(A|B_3) = 0.06$$

Use Baye's theorem and these probabilities to find following:
(1 Point)

$P(B_2|A) = ?$

0.5

25

Which types of sampling methods are considered better? Why?
(1 Point)

One of the best probability sampling techniques that helps in saving time and resources, is th

26

Let x be a random variable defined by the Binomial distribution with n trails. Let p be the probability of success and q be the probability of

failure. Which of the following statements is/are false?
(1 Point)

(1). The random variable is continuous.
(2). p and q does not depend on each other.
(3). p + q = 1

- (●) All statements are true
- ( ) Statements 2 and 3 are false
- ( ) Statements 1 and 2 are false
- ( ) All statements are false
- ( ) None of the other 4 options

27

The heights of 5 students are used to draw a conclusion about the heights of 60 students of CSE class. What is the population and sample size in this situation?
(1 Point)

60 population, 5 sample size

28

If a sample of size 7 results in the sample values 7, 2, 4, 5, 10, 6 and 3, find the sample variance.
(1 Point)

- (●) 7.00
- ( ) 5.29
- ( ) 2.49

2.69

29

The correlation coefficient is -0.5 and the regression coefficient y on x is -1.25. Determine the regression coefficient x on y.
(1 Point)

-0.2

30

Out of all the districts of Gujarat, these 5 districts are selected as a sample to analyze overall rainfall of Gujarat for the month June: Banaskantha, Bhavnagar, Jamnagar, Dahod and Valsad. The rainfall during June 2020 in Banaskantha, Bhavnagar, Jamnagar, Dahod and Valsad was found to be 64 mm, 174 mm, 245 mm, 66 mm, 285 mm respectively. Find the sample variance and write your answers in the box given below.
(2 Points)

10216.7

Submit