

2. Fed-ex recorded the number of parcels submitted by each of its 30 branches last month as follows:[8]

138	172	145	103	117	119	158	168
133	145	102	144	165	136	164	128
126	150	146	148	145	125	116	138

Construct stem and leaf display. Also construct box plot and describe the shape of the distribution.

3. The strength of certain type of cable is given below.

strength	Below5	5-10	10-15	15-20	20-25	25above
No of cable	4	12	20	15	8	5

Calculate appropriate relative measure of Dispersion.

4. Calculate Spearman's Rank correlation coefficient from the following.

Knowledge	55	62	43	55	64	77	68	59	64	70
Anger	91	52	51	63	52	52	67	88	75	71

5. The combined mean and variance of marks of 250 students of section A and section B are 560 and 5497 respectively. The mean and variance of the mark of 100 students of section A are 650 and 121 respectively. Find the variance of marks in section B..
6. The life time of of keyboard of certain brand in month is given below

Life time	10-12	12-14	14-16	16-18	18-20	20-22	22-24
frequency	10	14	18	22	18	14	10

Calculate the coefficient of kurtosis and interpret the result.

7. A problem of statistics is given to three students X, Y and Z. the probability that they can solve it is 0.2, 0.85 and 0.73 respectively. What is the probability that
- All can solve the problem?
  - None can solve the problem?
  - Problem will be solved
8. There are three machines A, B, and C producing 40%, 35% and 25% articles per hour respectively. These machines are known to be producing 2%, 3% and 4% defectives respectively. One article is selected at random from an hour production of the three machines and found to be defective. What is the probability that the article is produced from Machine C?
9. Describe census and sample survey. Write down the advantage of sample survey over census.

# TEXAS INTERNATIONAL COLLEGE

## MID-TREMINAL EXAM - 2024

Bachelor Level (B.Sc. CSIT)

Semester:2<sup>nd</sup> Semester

Subject: Statistics I(CSC169)

Full Mark: 60

Time: 3 hours

Pass Mark :30

SET A

Group A (2\*10=20)

### Attempt any two Questions

- (1) A study was done to study the effect of ambient temperature on the electric power consumed by a chemical plant. Following table gives the data which were collected from an experimental pilot plant.

Temperature (°F)	27	45	72	58	31	60	34	74
Electric power (BTU)	250	285	320	295	265	298	267	321

- Identify which one is a response variable, and fit a simple regression line, assuming that the relationship between them is linear.
- Interpret the regression coefficient with reference to your problem.
- Obtain coefficient of determination, and interpret the result.
- Based on the fitted model in (a), predict the power consumption for an ambient temperature of 65 °F.

- (2) Two computer manufacturers A and B compete for profitable and prestigious contract. In their rivalry, each claim that their computer a consistent. For this it was decided to start execution of the same program simultaneously on 50 computers of each company and recorded the time as given below:

Time is seconds		0-2	2-4	4-6	6-8	8-10	10-12
Number of computers manufactured by	A	5	16	13	7	5	4
	B	2	7	12	19	9	1

Which company's computer is more consistent?

- (3) The following dataset represents the number of new computer accounts registered during ten consecutive days.

5 45 32 53 46 100 40 47 40 38

- Compute the mean, median, quartiles, and sample standard deviation.
- Check whether there are outliers or not.
- If outliers are present, then delete the detected outliers and compute the mean, median, quartiles, and sample standard deviation again.
- Make your conclusion about the effect of outliers on descriptive statistical analysis.

### Group B (8 \*5 = 40)

### Attempt any Eight Question

1. From the following distribution of mark of 500 students of a college, find the minimum pass mark if only 20% of student had failed and also the minimum mark obtained by the top 25% of the student.

marks	0-20	20-40	40-50	50-60	60-80	80-100
No. of students	50	100	150	90	60	50

2. The production manager of a press determines the average time needed to photograph one printing plate. Using a stopwatch and observing the plate markers, he collects the following times (in seconds):

20.4 20.0 22.2 23.8 21.3 25.1 21.2 22.9 24.2 24.3 22.0 24.7  
25.7 24.9 22.7 24.4 24.3 23.6 23.2 21.0

Construct stem and leaf display and box and whisker plot for the given data.

3. As a part of study of the psychological correlates of success in athletes, the following measurements are obtained from members of Nepal national Football team.

Anger	6	7	5	21	13	5	13	14
Vigor	30	23	29	22	19	19	28	19

Calculate spearman's rank correlation coefficient.

4. The operating time of certain brand of device before a charge is required is given below.

Time	0-2	2-4	4-6	6-8	8-10	10-12
F	5	8	12	16	9	7

Determine the value of coefficient of kurtosis and also interpret the result obtained.

5. From the following frequency compute quartile deviation and its relative measure.

	0-5	5-10	10-15	15-20	20-25	25-30
	4	12	20	15	8	5

6. Two brothers: Mr. X and Mr. Y appear in an interview for getting scholarship. The scholarship can be provided for two persons. The probability of getting scholarship by Mr. X and is  $1/7$  and getting by Mr. Y is  $1/5$ . What is the probability that

- Both of them will get scholarship
- Only one of them will get scholarship
- None of them will get scholarship

7. The following table gives the details of the consumer preference for a new product to be introduced in the market.

	Number of consumers			
	Like	Dislike	Neutral	Total
Male	500	250	125	875
Female	200	350	75	625
Total	700	600	200	1500

What is the probability that a consumer chosen at random

- Likes a new product?
- Is a female?
- Is male and neutral for new product?
- Who like the product, given that consumer is female?

8. There are three machines A, B, and C producing 100, 200 and 300 articles per hour respectively. These machines are known to be producing 2%, 3% and 4% defectives respectively. One article is selected at random from an hour production of the three machines and found to be defective. What is the probability that the article is produced from Machine C?

9. What do you mean by measurement scale? Describe different types of measurement scales in statistics.

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SET B

Group "A" (2\*10=20)

Attempt any two question.

1. A chemical company wishing to study the effect of extraction time on the efficiency of an extraction operation obtained the data as follows:

Extraction time in minute (X)	27	45	41	19	35	39	19
Extraction efficiency in % (Y)	57	64	80	46	62	72	52

- Find the regression equation which best describe the given variables.
- Find the coefficient of correlation between extraction time and extraction efficiency.
- Determine the coefficient of determination and interpret it.
- Compute standard error of estimate.

2. Write down the difference between measure of central tendency and dispersion..The life of two model A and B of polythene bags in a recent survey shown below:

Bursting pressure (in lb.)	No of polythene bags	
	A	B
5-10	2	9
10-15	9	11
15-20	29	18
20-25	44	32
25-30	11	17
30-35	5	13

- What is the average life of each model?
- Which model has greater uniformity and why?

3. The following data set represents the number of new computer accounts registered during ten consecutive days.

43 37 50 51 58 105 52 45 45 10

- Compute the mean, median, quartiles, and sample standard deviation.
- Check whether there are outliers or not.
- If outliers are present, then delete the detected outliers and compute the mean, median, quartiles, and sample standard deviation again.
- Make your conclusion about the effect of outliers on descriptive statistical analysis.

GROUP B (8 \*5= 40)

Attempt any Eight Questions

1. The average electricity consumption and standard deviation of the two sets of households are as follows:

	Set A	Set B
Mean	65 units	72 units
Standard deviation	13 units	18 units
Number of households	50	40

- Which set, A or B, has larger electricity consumption?
- Which set is more variable?
- Find combined standard deviation?