

Seat No: _____

Enrollment No: _____

PARUL UNIVERSITY
FACULTY OF MANAGEMENT
MBA, Winter 2018 - 19 Examination

Semester: I
Subject Code: 06200103
Subject Name: Business Statistics

Date: 26/10/2018
Time: 10:30am to 1:00pm
Total Marks: 60

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed.

A). Multiple choice type questions/Fill in the blanks. (Each of 1 mark) (05)

1. According to Empirical rule, how much percentage of data lies between $\mu \pm 2\sigma$ of a normal distribution curve?

- | | |
|--------|----------|
| a) 68% | c) 99.7% |
| b) 95% | d) 100% |

2. A graph of a cumulative frequency distribution is called

- | | |
|--------------|----------------------|
| a) Ogive | c) Frequency polygon |
| b) Histogram | d) Pie diagram |

3. Which of the following is not a measure of central tendency of grouped data?

- | | |
|---------|-----------------------|
| a) Mean | c) Median |
| b) Mode | d) Standard deviation |

4. The correlation coefficient (r) for a given data set 0.978 says that there is _____ between the variables.

- | | |
|----------------------------------|--------------------------------|
| a) Strong negative correlation | c) Strong positive correlation |
| b) Moderate negative correlation | d) No correlation |

5. The Mann Whitney U test is used to compare the means of two _____

- | | |
|---------------------------|-------------------------|
| a) Independent population | c) Dependent Population |
| b) Independent sample | d) Dependent sample |

B). Define the following. (Each of 1 mark) (05)

1. Define Empirical rule.
2. Skeweness
3. Coefficient of determination.
4. Dependent and Independent event
5. What are the steps of preparing a frequency distribution?

C). Direct questions. (Each of 1 mark) (05)

1. classify the below mentioned as nominal, ordinal, interval or ration data:

- a) The time required to produce each tire on an assembly line.
- b) An employee's identity number.

2. The average price of Stock A is 65.5 and its standard deviation is 14.2215 also the average price of stock B is 142.5 with a standard deviation of 14.5344. You want to invest in one of the stock. Select the stock for investment by using the method of coefficient of variation.

3. Calculate P_{50} for the given data set: 5 9 16 17 18

4. The average fill volume of a regular can of soft drink is 12 ml. suppose the fill volume of these cans ranges from 11.97 to 12.03 ml is uniformly distributed. What is the probability that a randomly selected can contains more than 12.01 ml of drink?

5. Calculate the Laspeyres price index for 2011 by taking 2008 as base year with the following data:

$$\sum P_{2008}Q_{2008} = 99.55, \quad \sum P_{2011}Q_{2008} = 112.58, \quad \sum P_{2008}Q_{2010} = 109.85 \quad \text{and} \quad \sum P_{2010}Q_{2010} = 119.85.$$

Q.2 Answer the following questions.

- A). Is the number of children that a college student currently has independent of the type of college or university being attended? Suppose students were randomly selected from three types of colleges and universities and the data shown represents the results of a survey of those students. Use Chi-square test of independence to answer the question. Let $\alpha = .05$ (07)

		Type of college or university		
		Community college	Large University	Small college
Number of children	0	25	178	31
	1	49	141	12
	2	31	54	8
	3 or more	22	14	6

- B). As head of the department of a consumer's research organization, you have the responsibility for testing and comparing lifetimes of four brands of electric bulbs. Suppose you test the lifetime of three electric bulbs of each of the four brands. The data shown below, each entry represents the lifetime of three electric bulbs of each of the four brands. The data are shown below, each entry represents the lifetime (in hundreds of hours) of an electric bulb. Can we infer that the mean lifetimes of the four brands of electric bulbs are equal? Take $\alpha = 0.05$ for ANOVA. (08)

BRANDS			
A	B	C	D
20	25	24	23
19	23	20	20
21	21	22	20

Q.3 Answer the following questions.

- A). Suppose the average speed of passenger trains travelling from Mumbai to Delhi are normally distributed, with a mean average speed of 88 km/hr and a standard deviation of 6.4 km/hr. (07)
- what is the probability that a train will average less than 70 km/hr?
 - what is the probability that a train will average more than 80km/hr?
 - what is the probability that a train will average between 90 and 100 km/hr?
 - What is the probability that a train will average between 75 and 95 km/hr?

- B). A research agency administers a demographic survey to 90 telemarketing companies to determine the size of their operations. When asked to report how many employees now work in their telemarketing operation, the companies gave responses ranging from 1 to 100. The agency's analyst organizes the figures into a frequency distribution. **(08)**

Number of employees working in telemarketing	Number of companies
0- under 20	32
20 – under 40	16
40 – under 60	13
60 – under 80	10
80 – under 100	19

- Compute the mean, median and mode for this distribution.
- Also compute the sample standard deviation and variance of the data.

Q.4 Attempt any two questions. (Each of 7.5 mark) (15)

- A researcher has collected a response for satisfaction about a new mobile from a sample of mobile users. He wants to check whether the sample was generated randomly or not. The response he got is as follows: SNNNNNSNNSNNSNSNSNNSSNNN.
Use small sample Runs test to determine whether the sample was generated randomly or not.
- Following data shows the number of issues from initial public offerings for a period of 8 years. Use this data to develop forecasts for the year 3 through 8 by using 2 month moving average method. Also calculate 2 month weighted moving average method by taking a weight of 3 for immediate previous year and 2 for the remaining year.

Time period	Value	Time period	Value
1	211	5	242
2	228	6	227
3	236	7	217
4	241	8	203

- Explain different levels of data measurement with relevant examples.
- A small independent physician's practice has three doctors. Dr. Sharma sees 41% of the patients, Dr. Tarun sees 32% , and Dr. John sees the rest. Dr. Sharma requests blood tests on 5% of her patients, Dr. Tarun requests blood tests on 8% of his patients, and Dr. John requests blood tests on 6% of his patients. An auditor randomly selects a patient from the past week and discovers that the patient had a blood test as a result of the physician visit. What is the revised probability that the blood test was requested by Dr. Sharma or Dr. Tarun or Dr. John.