

PARUL UNIVERSITY
FACULTY OF MANAGEMENT
MBA Winter 2019 - 20 Examination

Semester: 1
Subject Code: 06200103
Subject Name: Business Statistics

Date: 06/12/2019
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. In a survey, a sample of 1000 households is selected and several variables are recorded. Several statements are made as follows – based on the data collected. One of the statement is incorrect, identify that statement:

- | | |
|--|---|
| a) Total household income (in \$) is interval level data | c) The number of people living in a household is a discrete variable |
| b) Socio economic status – noted as “low income”, “middle income”, “high income” is nominal level data | d) The primary language spoken in the household is ordinal level data |

2. A positively skewed distribution has one of the following characteristics:

- | | |
|--|--|
| a) Its skewness coefficient is less than equal to zero | c) Its shape is similar to that of a normal distribution |
| b) It is symmetric in shape | d) It has a long right tail |

3. According to empirical rule, approximately what percentage of normally distributed data lies within one standard deviation of the mean?

- | | |
|-------|---------|
| a) 95 | c) 99.7 |
| b) 34 | d) 68 |

4. Two Machines A and B produce parts of type X and type Y. Machine A produces 60% of all the parts, whereas B produces rest of the parts. Further Machine A produces 70% of parts of type X, whereas Machine B produces 40% of parts of type Y. If in a production run, a quality control inspector finds a part of type X, then the probability that this part was made by Machine A is:

- | | |
|--------|--------|
| a) 37% | c) 42% |
| b) 24% | d) 63% |

5. Which one(s) of the following statistical test(s) is/are based on Non-parametric data?

- | | |
|------------------------------|---------------------|
| a) Mann-Whitney U Test | c) Runs Test |
| b) Spearman Rank Correlation | d) All of the above |

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

1. Discrete Random Variable
2. Continuous Random Variable
3. Index Number
4. Kurtosis
5. Percentile

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

1. What is the central limit theorem in sampling distribution?
2. What is the Chebyshev's theorem?
3. What is Poisson Distribution?
4. What are the key characteristics of Uniform distribution?
5. How box plot can be used for data reduction?

Q.2 Answer the following questions.

A). What are the different primary levels of data in statistics? (07)

B). Find out the mean, variance, standard deviation and coefficient of variation for the following sample data: 12 10 7 16 19 (08)

Q.3 Answer the following questions.

An International BPO operated by the BIRLAS group, has the following frequency distribution of employees based on their age groups. Prepare a Histogram and an O-give curve, to support this group in graphical analysis of this data.

A).

Class Interval	Number of employees
20-30	1005
30-40	219
40-50	113
50-60	78
60-70	15

(07)

A machining industry, gives three different types of skill based training A, B and C to three matched groups of selected workers. After the training, these groups of workers start working on the machines, and after a month their average production efficiency is reported as follows.

B).

Training Method (A)	Training Method (B)	Training Method (C)
11	18	12
14	21	18
12	38	24
18		11
		9

(08)

Is there a significant difference between the three training methods when it comes to worker production efficiency? Use significance value of 0.01, to test your hypothesis.

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

1. A Mutual fund organization, is interested in finding out whether – the preference for investing in mutual fund is dependent on the region from which an investor belongs. For this the organization has collected data from investors, which is shown in the following cross-tabulation.

		Preference Level to Invest in Mutual Fund	
		Highly Preferred	Least Preferred
Region from	North	5	10
	South	12	7
	East	11	20
	West	15	8

Help the organization, to test the dependence between given variables, at a significance level of 0.05.

2. A Marketing Head working at “Burger Paints Ltd.”, is interested in predicting the Revenue (in Rs. Crore) based on the Promotional effort (in Rs. Crore) done by this firm. For this he has collected the following past data:

Sales Revenue (Rs. Crore)	15	16	19	34	49
Promotional effort (Rs. Crore)	3	4	8	10	15

If, you have to assist the Marketing Head, as above, then:

- (a) Find out the carl pearson correlation coefficient
- (b) Find the equation of the linear regression model
- (c) What will be the predicted Sales Revenue, if the firm spends Rs. 25 crore on Promotional effort?

3. Describe the different Sampling Techniques.

4. In a Rugby selection there are **five** prospective candidates identified by the sports authority. From the past it is known that the probability of selection of a candidate is **0.8**. If the selection process follows Binomial distribution, then what is the probability that

- (a) Exactly **two** candidates get selected?
- (b) at least three candidates get selected?
- (c) at the most two candidate get selected?