Paper / Subject Code: 94727 / Information Technology : Research in Computing (R.2019)

(Time: $2\frac{1}{2}$ hours)

[Total Marks: 60]

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculator is **allowed**.

1. Attempt *any two* of the following: 12
   a. Define Business Research. Discuss the considerations while determining the need to conduct a Business Research.
   b. Explain the characteristics of useful and valuable information for Business Research.
   c. Define the term theory. Explain the process of theory building, stating its goals.
   d. Describe the importance of Business Ethics highlighting various obligations of a Researcher with respect to confidentiality.

2. Attempt *any two* of the following: 12
   a. Explain the importance of Problem Definition and briefly explain the steps of Problem-definition Process.
   b. Compare the approaches of Qualitative and Quantitative Research.
   c. Discuss the advantages and disadvantages of a Focus Group Interview.
   d. Describe the common research objectives of secondary data study using appropriate examples.

3. Attempt *any two* of the following: 12
   a. State and explain the major sources of Errors in Survey Research.
   b. What are the advantages of Mail Surveys? Discuss the efforts to be made to increase the response rates for mail surveys.
   c. Describe various techniques of Mechanical Observations used for measuring Physiological Reactions.
   d. Explain the purpose of the following Experimental Design for research with suitable examples:
      i. Static Group Design
      ii. One-Shot Design

4. Attempt *any two* of the following: 12
   a. Suppose that following is the rainfall (in centimetres) recorded in your city on a certain day:

Time during the day	Amount of Rain Fall in Centimetres
12:00 am	32
03:00 am	28
6:00 am	30
9:00 am	27
12:00 noon	28
03:00 pm	33
06:00 pm	34
09:00 pm	28

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    i. Calculate the mean, median and mode for the above temperatures.
    ii. Prepare frequency distribution for the above data.
    iii. Calculate standard deviation for the above data.
    iv. Why is standard deviation rather than average deviation typically used?

b. Define Validity. Discuss various components of construct validity.

c. Discuss the types of Fixed-Alternative Questions stating their purpose. How do the Fixed-Alternative Questions differ from Open-Ended Response Questions?

d. Describe the significance of Probability Sampling. Explain any 4 techniques of Probability Sampling stating their advantages and disadvantages.

5. **Attempt _any two_ of the following:**   12

a. Describe the different types of hypothesis commonly tested for research. Differentiate between Type I and Type II errors.

b. Explain the purpose of Factor Analysis and give its broad classification. How does Factor Analysis help for data reduction?

c. What is Multivariate Statistical Data analysis? What are the steps of interpreting a multiple Regression Analysis results?

d. A WELLNESS health centre believes that the proportions of births in a certain country on each day of the week are equal. A random sample of 700 birth records from a recent year is selected for study. The results of the study are recorded in the following table:

Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Birth Frequency	65	103	114	115	116	112	75

As a research consultant suggest if there is enough evidence to support the Health Centre's claim at a significance level of 0.01.

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