PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF COMMERCE
END TERM EXAMINATION - JUN 2023

Semester : Semester II - 2022
Course Code : BBB3003
Course Name : Sem II - BBB3003 - Essential Statistics for Business Analytics
Program : BCH

Date : 22-JUN-2023
Time : 1.00PM - 4.00PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS   (10 X 2 = 20M)

1. The following data representing the ages of a group of 20 individuals: 25, 28, 30, 32, 35, 38, 40, 42, 45, 47, 50, 52, 55, 58, 60, 62, 65, 68, 70, 72. Outline the steps to calculate, Mean, Median, Mode, Range, Variance and Standard Deviation for the data set using Excel.

   (CO2) [Knowledge]

2. What is sampling in the context of statistical analysis? Highlight any 2 benefits of sampling.

   (CO4) [Comprehension]

3. What is sampling error and how is it estimated in statistical analysis? Provide an example.

   (CO4) [Comprehension]

4. What are the different types of One-tail Alternate Hypothesis based on the direction of test?

   (CO5) [Comprehension]

5. Explain Data Analysis button on excel.

   (CO1) [Knowledge]

6. Outline the difference between primary and secondary data.

   (CO1) [Knowledge]

7. A dataset representing the test scores of 12 students: 78, 85, 90, 68, 72, 80, 88, 92, 76, 82, 95, 84 is given, Calculate the quartile deviation of the dataset.

   (CO2) [Knowledge]

8. Explain Law of Addition of Probability. A bag containing 4 red balls, 5 green balls and 6 blue balls. You randomly select one ball from the bag. What is the probability of selecting a red ball or a blue ball?

   (CO3) [Knowledge]

9. What is binomial distribution? Consider a coin is flipped 3 times. The random variable X represents the number of heads obtained in these 3 flips. Use the binomial distribution formula, we can calculate the probabilities for different values of X.

(CO3) [Comprehension]

10. What is ANOVA? Explain One-way and Two-way Anova.

(CO5) [Comprehension]

PART B

ANSWER ALL THE QUESTIONS   (4 X 10 = 40M)

11. What are the various types of sampling and non sampling errors?
A market research firm wants to conduct a survey to estimate the average monthly household income in a city. They decide to use a simple random sampling technique to select 500 households from the city's population. The survey results show an average monthly household income of $4,000 with a standard deviation of $500.
a. Identify and explain one potential sampling error in this study.
b. Identify and explain one potential non-sampling error in this study.

(CO4) [Comprehension]

12. A soft drink company claims that the average sugar content in their 500ml bottle is 30 grams. You decide to conduct a hypothesis test to determine if the company's claim is statistically significant. You collect a random sample of 40 bottles and measure their sugar content. The sample has a mean sugar content of 28.5 grams with a standard deviation of 2 grams.
Using a significance level of 0.05, perform a hypothesis test to determine if there is evidence to support the company's claim. Given that critical Z-value corresponding to a significance level of 0.05 (two-tailed) is ±1.96.

(CO5) [Comprehension]

13. Explain the concept of Measures of Central Tendency. Identify the strength and challenges for each of these measures.

(CO2) [Comprehension]

14. What are the different ways to classify data types? Elaborate.

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS   (2 X 20 = 40M)

15. Explain Skewness and various measures of skewness.

(CO2) [Comprehension]

16. A factory produces two types of widgets: Type A and Type B. Type A widgets make up 60% of the total production, while Type B widgets make up the remaining 40%. The quality control department randomly selects a widget from the production line and tests it. The test is known to be 90% accurate for Type A widgets and 80% accurate for Type B widgets. If a randomly selected widget tests positive for being defective, what is the probability that it is a Type A widget?

(CO3) [Application]