Question 1: Customer Satisfaction Improvement

A company recorded an average customer satisfaction score of 72 before introducing a new feedback process. After implementation, a random sample of 30 customers reported an average score of 78 with a standard deviation of 10. At the 5% significance level, test whether the new feedback process has significantly improved customer satisfaction.

Question 2: School Performance Claim

A school claims that its students perform better than the national average math score of 75. A random sample of 50 students produced an average score of 77 with a standard deviation of 8. At the 1% significance level, test whether the claim is statistically justified.

Question 3: Retail Sales Strategy

A retail store reports historical average daily sales of ■10,000. After implementing a new sales strategy, sales data over 15 days showed an average of ■11,200 with a standard deviation of ■1,500. At the 5% significance level, test whether the strategy has increased average daily sales.

Question 4: Light Bulb Lifespan Accuracy

A manufacturer advertises an average bulb lifespan of 1200 hours. A random sample of 40 bulbs showed a mean lifespan of 1180 hours with a standard deviation of 50 hours. At the 5% significance level, test whether the advertised claim is accurate.

Question 5: Average Height Comparison

A researcher studies whether the average height of adult males in a city differs from the national average of 5.8 feet. A sample of 25 individuals has an average height of 5.7 feet with a standard deviation of 0.3 feet. At the 1% significance level, test whether the difference is statistically significant.

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