**Decision Science**

**NMIMS Centre for Distance and Online Education (NCDOE)**

**Internal Assignment Applicable for April 2025 Examination**

**1) Calculate Quartile Deviation from the following:**

|  |  |
| --- | --- |
| **Earnings (Rs)** | **Number of Persons** |
| **25** | **25** |
| **26** | **70** |
| **27** | **210** |
| **28** | **275** |
| **29** | **430** |
| **30** | **550** |
| **31** | **340** |
| **32** | **130** |
| **33** | **90** |
| **34** | **55** |
| **35** | **25** |

**Answer:**

**Introduction:**

Quartile Deviation (QD) is a measure of statistical dispersion, reflecting the spread of the middle 50% of a dataset. It is calculated as the difference between the third quartile (Q3) and the first quartile (Q1), divided by 2. This metric provides insights into the variability of data while minimizing the impact of outliers. Quartile Deviation is particularly useful for understanding the range within which most of the data points lie, offering a clearer picture of central tendency and dispersion.

To calculate the Quartile Deviation (QD), we need to first determine the Q1 (First Quartile) and Q3 (Third Quartile). The formula for Quartile Deviation is:

**This is partially solved sample answer**

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**2) Calculate Median from the following:**

|  |  |
| --- | --- |
| **Class - Interval** | **Number of Students** |
| **0-10** | **5** |
| **10-20** | **8** |
| **20-30** | **7** |
| **30-40** | **12** |
| **40-50** | **28** |
| **50-60** | **20** |
| **60-70** | **10** |
| **70-80** | **10** |

**Answer:**

**Introduction:**

The median is a measure of central tendency that divides a dataset into two equal parts. In a frequency distribution, it represents the value below which 50% of the observations lie. To calculate the median from grouped data, we need to identify the median class, which is the class where the cumulative frequency first exceeds half of the total number of observations. Using this information and the class boundaries, we can apply a formula to determine the exact median value for the given data.

The formula for the median is:

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**3.a) A bag contains 6 white and 4 black balls. Two balls are drawn at random one after another without replacement. Find the probability that both drawn balls are white.**

**Answer:**

**Introduction:**

In this problem, we are asked to find the probability of drawing two white balls consecutively from a bag containing 6 white and 4 black balls. Since the balls are drawn without replacement, the probability changes after each draw, requiring us to calculate the combined probabilities for both events.

To find the probability that both drawn balls are white, we need to use the concept of probability in a scenario without replacement.

Since both events (drawing a white ball on the first and second draw) are dependent events, we multiply the probabilities:

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**3.b) In an intelligence test administered on 1000 children, the average was 42 and standard deviation was 24. Find the number of children exceeding a score of 50.**

**Answer:**

**Introduction:**

In this problem, we are tasked with finding the number of children who scored above 50 on an intelligence test. Given the average score (42) and standard deviation (24), we will calculate the Z-score for the threshold of 50, and use this to determine the proportion of children exceeding that score.

To find the number of children exceeding a score of 50 in the intelligence test, we can use the Z-score formula and refer to the standard normal distribution.

The Z-score formula is:

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