Business Statistics: BIM

NCCS College

Set B

**Group A (1x 10 = 10)**

**Brief answer question: Attempt all questions**

1. If first, second and third quartile of a data set are 40, 55 and 70 respectively, find the Bowley’s coefficient of skewness.
2. The average monthly salary of 10 male staffs and 5 female staffs of a manufacturing company are Rs 20000 and Rs 18000 respectively. Find the average monthly salary of all staffs taken together.
3. In a certain course, a student’s final mark is compute using the fallowing weights: quizzes 10 % test 40% and examination 50 %. Find his weighted mark, if his marks in each of these categories are 81, 75 and 70 respectively.
4. On an average 4 customers per minute arrives at any of the checkout counters of a department store, what is the probability that at least two customers arrive at the checkout counter.
5. Find the median marks from the given information:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Marks | 45 | 30 | 70 | 40 | 75 | 50 |
| No. of students | 9 | 6 | 4 | 7 | 2 | 5 |

1. What is a primary data? What are the main sources of collecting primary data
2. Karl Pearson’s coefficient of skewness of a distribution is 0.4. If the values of mean and median are 25 and 20 respectively, find the standard deviation.
3. If , and S.D. of X = 2. Find the value of S.D. of Y
4. If semi-interquartile range is 2, and middle 80 % range is 8, find the coefficient of kurtosis.
5. Three cards are drawn from an ordinary deck and not replaced. Find the probability of getting an ace, a king and queen in order

**Group B (3 x 5 = 15)**

**Short Answer Questions: Attempt any five questions**

1. Suppose the waist measurement of 800 persons are normally distributed with mean 66 cm and standard deviation of 5 cm. Find the number of persons waist between 60 cm and 72 cm.
2. The following is the frequency distribution of monthly income of 500 workers in a factory.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Monthly Income (x 1000 Rs) | Below 100 | 100-150 | 150-200 | 200-250 | 250-300 | 300 and above |
| No. of workers | 10 | 25 | 145 | 220 | 70 | 30 |

Compute the mode of the distribution

1. The distribution of marks of 500 students of a campus is given below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 0-20 | 20-40 | 40-50 | 50-60 | 60-80 | 80-100 | Total |
| No. of students | 50 | 100 | 150 | 90 | 60 | 50 | 500 |

What is the minimum marks obtained by top 20 % of students.

1. A cybersecurity system uses a multi-layered defense mechanism to detect intrusions. The system consists of three independent detection methods:

* Firewall-based detection (catches 85% of attacks).
* Anomaly detection algorithm (catches 70% of attacks).
* Signature-based detection (catches 60% of attacks).

An attack is launched against the system.

1. What is the probability that the attack evades all three detection methods?
2. What is the probability that at least one of the three detection methods will catch the attack?

15. The following are the ages of 48 patients admitted to the emergency room of a hospital. Compute coefficient of skewness. How would you describe the shape of these data?

32 63 33 57 35 54 38 53 42 51 42 48 43 46 61 53 09 13 16 16 31 30 28 28 25 23 23 22 21 17 13 30 14 29 16 28 17 27 21 24 22 23 61 55 34 42 13 26

Construct a stem-and-leaf display and comment on the shape of the distribution age of patients

1. The analysis of monthly wages paid to the workers in two firms A and B, belonging to the same industry gives the following results.

|  |  |  |
| --- | --- | --- |
| Measures | Firm A | Firm B |
| No. of wage earners | 500 | 600 |
| Average monthly wages | Rs 586 | Rs 575 |
| Variance of wages | Rs 81 | Rs 100 |

1. Compute coefficient of variation for each firm
2. In which firm, there is greater variability in wages?

**Group C (3 X 5 = 15)**

**Long Answer Questions (Attempt any three questions)**

1. The following data relates to the marks in subject STATISTICS and MARKETING in a board exam.

|  |  |  |
| --- | --- | --- |
| Measures | Statistics | Marketing |
| Mean | 39.5 | 47.5 |
| S.D. | 10.8 | 16.8 |
| Correlation coefficient | 0.42 | |

1. Fit the two lines of regressions
2. Estimate the marks of a students in Marketing who scored 60 in Statistics
3. Estimate the marks of a students in Statistics who scored 70 in Marketing
4. Calculate Spearman’s rank correlation for the relationship between the scores of ten students on a Mathematics aptitude examination and English aptitude examination.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Students | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Math Score | 57 | 45 | 72 | 78 | 53 | 63 | 86 | 98 | 59 | 71 |
| English Score | 83 | 37 | 41 | 84 | 56 | 85 | 77 | 87 | 70 | 59 |

1. A financial analyst is comparing the monthly returns (%) of two stocks, Stock X and Stock Y, over the past 12 months to assess their risk levels. The monthly returns for each stock are as follows:

Stock X Returns (%):

3.2, 4.5, -2.1, 5.6, 6.3, -1.8, 4.0, 3.9, -0.5, 5.2, 2.8, 4.1

Stock Y Returns (%):

2.1, 3.8, -1.5, 4.9, 5.5, -1.2, 3.7, 3.3, 0.2, 4.6, 3.1, 3.9

(a) Compute the mean return, standard deviation, and coefficient of variation (CV) for both stocks.

(b) Based on the CV, which stock has higher relative volatility?

(c) If you were an investor looking for a more stable investment, which stock would you prefer, and why?

1. In an examination that contains 10 multiple-choice questions with 4 possible choices for each question, only one of which is correct, a student selects the answer for every question randomly. To pass the example, the student has to give correct answers for at least 5 questions.

What is the probability that: (a) student give no correct answer (b) the students fail in the exam.

**Group D (1 x 20 = 20)**

**Comprehensive Answer Questions**

21. The data on the income and expenditure of people of certain locality is given below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Expenditure (Rs) | Income (Rs) | | | | |
| 0-500 | 500-1000 | 1000-1500 | 1500-2000 | 2000-2500 |
| 0-400 | 12 | 6 | 8 |  |  |
| 400-800 | 2 | 18 | 4 | 5 | 1 |
| 800-1200 |  | 8 | 10 | 2 | 4 |
| 1200-1600 |  | 1 | 10 | 2 | 1 |
| 1600-2000 |  |  | 1 | 2 | 3 |

1. Find the correlation coefficient between Income vs Expenditure
2. Find the regression equation of expenditure on income
3. Find the coefficient variation of income and expenditure