**BUSINESS STATISTICS**

**Q.1**

**(a). Describe the importance and scope of Statistics**

**(b). Explain the characteristics of a frequency distribution.**

**(c). Explain how statistics plays an important role in management planning and decision making?**

**(d). With the help of few examples explain the role of statistics as a managerial tool.**

**Ans 1.**

**Importance and Scope of Statistics**

**Importance of Statistics**

Statistics is a crucial discipline in both academic and professional fields as it provides tools for collecting, analyzing, interpreting, and presenting data. In today’s data-driven world, statistics help convert raw data into meaningful information that supports evidence-based decision-making. Whether in business, economics, medicine, or social sciences, statistics enable researchers and professionals to understand trends, test hypotheses, and make informed predictions. In business operations, statistics are important for quality control, market analysis,

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**Q.2**

**The take-home salary (in Rs.) of 40 unskilled workers from a company for a particular month was.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2482** | **2392** | **2499** | **2412** | **2440** | **2444** |
| **2446** | **2540** | **2394** | **2365** | **2412** | **2458** |
| **2482** | **2394** | **2450** | **2444** | **2440** | **2494** |
| **2460** | **2425** | **2500** | **2390** | **2414** | **2365** |
| **2390** | **2460** | **2492** | **2500** | **2470** | **2428** |

**Construct a frequency distribution having a suitable number of classes.**

**Ans 2.**

### **Constructing a Frequency Distribution for Salary Data**

### **Step 1: Given Raw Data**

We are given the take-home salary (in ₹) of 40 unskilled workers:

2482, 2392, 2499, 2412, 2440, 2444,
2446, 2540, 2394, 2365, 2412, 2458,
2482, 2394, 2450, 2444, 2440, 2494,
2460, 2425, 2500, 2390, 2414, 2365,
2390, 2460, 2492, 2500, 2470, 2428,
2460, 2410, 2450, 2478, 2400, 2415,
2496, 2475, 2405, 2446

### **Step 2: Find the Range**

**Minimum Salary = ₹2365** **Maximum Salary = ₹2540**

**Range** = Max - Min = 2540 - 2365 = **₹175**

### **Step 3: Find the Number of Classes (k)**

Use **Sturges’ Formula**: k = 1 + 3.322 log₁₀(n) Where n = 40 (number of values)

**Q.3**

**The following data give the points scored in a tennis match by two players X and Y at the end of twenty games:**

**(10, 12) (7, 11) (7, 9) (15, 19) (17, 21) (12, 8) (16, 10) (14, 14) (22, 18) (16, 7)
(15, 16) (22, 20) (19, 15) (7, 18) (11, 11) (12, 18) (10, 10) (5, 13) (11, 7) (10, 10)**

**Taking class intervals as: 5–9, 10–14, 15–19..., for both X and Y, construct:
(i) Bivariate frequency table.
(ii) Conditional frequency distribution for Y given X > 15.**

## **Ans 3.**

## **Bivariate Frequency Table and Conditional Distribution**

### **Given Data (Scores by Players X and Y in 20 Games)**

Each pair shows (X, Y):

(10,12), (7,11), (7,9), (15,19), (17,21),
(12,8), (16,10), (14,14), (22,18), (16,7),
(15,16), (22,20), (19,15), (7,18), (11,11),
(12,18), (10,10), (5,13), (11,7), (10,10)

### **Step 1: Define Class Intervals**

Let’s take class intervals as per instruction:

**Q4. A survey of 370 students from the Commerce Faculty and 130 students from the Science Faculty revealed that:**

* **180 students were studying for only C.A. Examinations**
* **140 for only Costing Examinations**
* **80 for both C.A. and Costing Examinations**
* **The rest had opted for part-time Management Courses**
* **Of those studying for Costing only, 13 were girls and 90 boys belonged to the Commerce Faculty.**
* **Out of the 80 studying for both C.A. and Costing, 72 were from the Commerce Faculty amongst whom 70 were boys.**
* **Amongst those who opted for part-time Management Courses, 50 boys were from the Science Faculty and 30 boys and 10 girls from the Commerce Faculty.**
* **In all, there were 110 boys in the Science Faculty.**

**Present this information in a tabular form.**

**Ans 4.**

Tabular presentation is a systematic and logical arrangement of classified data in rows and columns. It simplifies complex data and enhances clarity, making it easier to understand and analyze. In the given case, a survey was conducted involving students from two faculties—Commerce and Science—to study their enrollment in various professional courses. The students were pursuing one of the following: C.A. (Chartered Accountancy), Costing, both

**Q.5**

**(a) Find the missing frequencies in the following frequency distribution. The A.M. (Arithmetic Mean) of the given data is 11.09.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Class Interval** | **Frequency** | **Class** | **Frequency** |
| **9.3 – 9.7** | **2** | **11.3 – 11.7** | **14** |
| **9.8 – 10.2** | **5** | **11.8 – 12.2** | **6** |
| **10.3 – 10.7** | **f₃** | **12.3 – 12.7** | **3** |
| **10.8 – 11.2** | **f₄** | **12.8 – 13.2** | **1** |
|  |  | **Total** | **60** |

 **(b) The mean yearly salary paid to all employees in a company was Rs. 24,00,000.
The mean yearly salaries paid to male and female employees were Rs. 25,00,000 and Rs. 19,00,000, respectively. Find out the percentage of male to female employees in the company.**

**Ans 5**.

In statistics, the arithmetic mean represents the central tendency or average of a data set. When certain frequencies are missing from a frequency distribution, they can be determined using the known arithmetic mean of the data. This process involves applying the concept of the weighted average, where the sum of the product of class midpoints and their frequencies is divided by the total number of observations. If the total frequency is known and the mean is given, the missing frequencies can be calculated through simultaneous equations by balancing the total

**Q.6The number of employees, wages per employee and the variance of the wages of employees for two factories are given below:**

|  |  |  |
| --- | --- | --- |
| **No. of employees** | **Factory A** | **Factory B** |
| **Average wages per employee per month** | **1,200** | **100** |
| **Variance of the wages (Rs.)** | **81** | **256** |

**(a) In which factory is there greater variation in the distribution of wages per employee?
(b) Suppose in factory B, the wages of an employee were wrongly noted as Rs. 900 instead of Rs. 910.**

**Ans 6.**

In statistical analysis, the comparison of variation in datasets is essential to understand consistency and reliability. When comparing two factories based on employee wages, it's not sufficient to look only at average wages. A more meaningful comparison involves understanding the spread or variability in wages, which is measured using standard deviation and the coefficient of variation. The coefficient of variation expresses standard deviation as a