**Exercise:**

**Q.no.1.** Marks obtained by 9 students in statistics are given below. Calculate the arithmetic mean from the given information.

*52 75 70 43 65 40 35 48*

**Q.no.2.** Calculate the arithmetic mean of the following distribution.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variate: | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| *Frequency:* | 20 | 43 | 57 | 61 | 72 | 45 | 39 |

**Q.no.3.** Calculate the arithmetic mean of the following distribution.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variate: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| *Frequency:* | 20 | 43 | 57 | 61 | 72 | 45 |

**Q.no.4.** Calculate the arithmetic mean of the following data by using step deviation method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Daily wages (Rs) | 500-550 | 550-600 | 600-650 | 650-700 | 700-750 |
| *Frequency:* | 20 | 30 | 40 | 20 | 10 |

**Q.no.5.** Six internet service provider provides internet volume with price are as follow in a certain period. Calculate the average price per GB for internet service provider.

|  |  |  |
| --- | --- | --- |
| Service provider | Volume (GB) | Priced/GB (Rs) |
| Vianet | 1800 | 80 |
| Subisu | 7700 | 60 |
| Wimax | 2400 | 100 |
| Broad link | 1600 | 50 |
| World Link | 1000 | 60 |

**Q.no.6.** Find the average marks of all 150 students taken together from the given information.

|  |  |  |
| --- | --- | --- |
|  | Batch -I | Batch - II |
| *Avg. marks* | 50 | 55 |
| *No. of students* | 70 | 80 |

**Q.no.7.** Mean of 100 items was 50. Later on, it was found that two items were misread as 60 and 8 instead of 192 and 66. Find the correct mean.

**Q.no.8.** According to the census of 1991, following are the population figure, in thousands, of 10 cities:

1400, 1250, 1670, 1800, 700, 650, 570, 488, 2100, 1700

Find the median**.**

**Q.no.9.** Find the median of the following frequency distribution:

|  |  |
| --- | --- |
| **Marks** | **No. of students** |
| Less than 10 | 15 |
| Less than 20 | 35 |
| Less than 30 | 60 |
| Less than 40 | 84 |
| Less than 50 | 106 |
| Less than 60 | 120 |
| Less than 70 | 125 |

**Q.no.10.** The data relating to space left in GB of 100 computers of a company were given below.

Compute Median.

|  |  |
| --- | --- |
| **Free disk space** | **No. of computer** |
| 0-9 | 10 |
| 10-19 | 28 |
| 20-19 | 42 |
| 20-29 | 8 |
| 30-39 | 6 |
| 40-49 | 6 |

**Q.no.11.** Calculate the lower and upper quartiles, third decile and 60th percentile for the following distribution.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variate: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| *Frequency:* | 5 | 8 | 7 | 12 | 28 | 20 | 10 | 10 |

**Q.no.12**. The table given below represents the daily wage distribution of 130 workers. Find;

1. The range of income of the middle 60 % workers
2. Highest income of lower 25 % workers
3. Lowest income of higher 25 % workers

|  |  |
| --- | --- |
| **Wage (Rs per week)** | **No. of workers** |
| More than 70 | 130 |
| More than 85 | 122 |
| More than 100 | 109 |
| More than 115  han 115 | 79 |
| More than 130 | 44 |
| More than 145 | 26 |
| More than 160 | 14 |
| More than 175 | 5 |

**Q.no.13.** Calculate mode of the following distribution.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variate: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| *Frequency:* | 20 | 43 | 57 | 61 | 72 | 45 |

**Q.no.14.** The following data gives the weight distribution of 250 laptops. Compute the first three quartile and quartile deviation.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Weight in lbs:- | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 |
| Frequency: | 20 | 24 | 35 | 32 | 35 | 36 | 34 | 34 |

**Q.no.15.** The number of run score by players of two team in a test match are given below. Test which group is more consistent.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Team A | 10 | 25 | 85 | 72 | 115 | 80 | 52 | 45 | 30 | 10 |
| Team B | 120 | 15 | 30 | 35 | 42 | 65 | 80 | 34 | 25 | 15 |

**Q.no.16.** Two brands of tyres are tested for their life and the following result were found.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Life “000” km | 20-24 | 24-28 | 28-32 | 32-36 | 36-40 |
| Brand A | 8 | 15 | 12 | 8 | 7 |
| Brand B | 6 | 20 | 14 | 5 | 5 |

Both brands are offering same price and advertising in the favour of their brand testing saying that the brand has consistent life. If you are required to decide to purchase type of one of these two brands, which one do you prefer and why?

**Q.no.17.** Suppose there are two types of electric bulbs, type I electric bulb have a mean life of 500 hours with standard deviation 20 hours. The mean life of type II electric bulb is 600 hours with a standard deviation 35 hours. Which of the two types of bulbs you prefer to buy? Why?

**Q.no.18.** Calculate the karl-pearson correlation coefficient for the following data of sales and expenses in “000’ of rupees of 5 items. Using Assumed mean method.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sales | 43 | 36 | 41 | 34 | 50 |
| Expenses | 12 | 15 | 24 | 21 | 19 |

**Q.no.19.** Following figure gives the age in years of newly married husbands and wives (25,17) (26,18) (27,19) (25,17) (26,20) (25,17) (24,18) (26.20) (27,18) (28,19). Find the Correlation coefficient.

**Q.no.20.** Compute the karl-pearson correlation coefficient of correlation from the following data.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Price A | 25 | 28 | 35 | 20 | 22 | 30 | 31 | 22 |
| Price B | 35 | 39 | 48 | 29 | 30 | 38 | 40 | 32 |

Also,

1. Calculate its probable error
2. Interpret if the value of r is significant or not
3. Determine the limits within which the population correlation coefficient may be expected to lie.

**Q.no.21.** The following table gives the distribution of items and defective items among them according to size groups. Find the correlation coefficient between size and defect in quality.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Size group | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 |
| No. of items | 200 | 270 | 340 | 360 | 400 | 300 |
| No. of defective items | 150 | 162 | 170 | 180 | 180 | 120 |

**Q.no.22.** From the following data obtain the regression equation current in amperes and resistance in ohms using the method of least square and estimate the probable value of current if resistance in 4 ohms.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Resistance in ohms | 2 | 3 | 5 | 6 | 8 |
| Current in amperes | 10 | 8 | 7 | 3 | 1 |

**Q.no.23.** A chemical company wishing to study the effect of extraction time on the efficiency of an extraction operation obtained the data as follows

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Extraction time in minute(X) | 27 | 45 | 41 | 19 | 35 | 39 | 19 |
| Extraction efficiency in % (Y) | 57 | 64 | 80 | 46 | 62 | 72 | 52 |

Fit the straight line to the given data by the method of least square and use it to predict the extraction efficiency one can expect when the extraction time in 35 minutes.

**Q.no.24.** A computer manager interested to know how efficiency of his/her new computer program which depends on the size of incoming data. Efficiency will be measure by the number of processed requests per hour. In general, larger data sets require more computer time and therefore, fewer requests are processed within in 1 hour. Applying the program to data sets of different sizes, the following data were gathered.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Data size(gigabytes) | 6 | 7 | 7 | 8 | 10 | 10 | 15 |
| Processed requests | 40 | 55 | 50 | 41 | 17 | 26 | 16 |

1. Identify which one response variable and fit a sample regression line assuming that the relationship is linear.
2. Interpret the regression coefficient with reference to your problem
3. Obtained the coefficient of determination and interpret this
4. Based on the fitted model predict the efficiency of new computer for data size 12 gigabytes.

**Q.no.25.** Twenty balls are numbered from 1 to 20, if one ball is drawn at random, what is the probability that the ball drawn is

a. multiple of 4 or 7?

b. multiple of 4 and 7?

**Q.no.26.** What is the chance that a leap year selected randomly consists of 53 Sundays?

**Q.no.27.** A ball containing 8 black and 5 red balls. If 5 balls are drawn at random, find the probability that

a. all is black.

b. 2 black and 3 red.

**Q.no.28.** A cartoon contains 6 Dell laptops, 10 lenovo laptops and 6 Acer laptops, two laptops are selected at random, find the probability that

a. both laptops are Lenovo

b. one is Dell, and another is Acer laptop.

**Q.no.29.** 10 students in a class of 24 students are boys and remaining are girls. If 5 are choose out of 24 at random, what is the probability;

a. all are boys.

b. none of them is boy.

c. at least one of them being boy.

**Q.no.30.** A bag containing 24 balls numbered from 1 to 24. One ball is drawn at random. Find the probability that the ball drawn has a number which multiple of 3 or 4.

**Q.no.31**. a problem in statistics is given to two students A and B whose chance of solving are 1/3 and ¼ respectively. Find the probability that;

a. the problem is solved.

b. Only one of them can solved that problem

c. None of them will solve the problem

d. A solve it, but B cannot

e. Both can solve the problem.

**Q.no.32.** The following table shows the survey result regarding the purchase behavior of TV’s and DVD players in the last six months of 300 house held.

|  |  |  |
| --- | --- | --- |
| Purchase TV | Purchase DVD | |
| Yes | No |
| Yes | 5  0 | 50 |
| No | 80 | 120 |

a. Find the probability that a randomly selected household that purchased a TV.

b. Find the probability that a randomly selected household that purchased a TV and DVD.

c. What is the probability that he/she purchased a TV or DVD?

d. Find the probability that he/she purchased a DVD given that he/she purchased a TV.

**Q.no.33.** A bag contains 8 red and 6 white balls. Two balls are drawn randomly from the bag one after another without replacement. Find the probability that both balls are white.

**Q.no.34.** What is the probability that a couple’s second child will be;

a. a boy, given that the first child was a girl.

b. a girl, given that the first child was a boy.

**Q.no.35.** About 20% of users do not close Windows properly, Suppose the Windows is installed in a computer lab of a college that is used by a random student in random order.

a. What is the probability that exactly 10 out of 15 students will close windows properly?

b. What is the probability that at least 3 students will not close Windows properly out of 10 students?

**Q.no.36.** On a very long mathematics test, Ram got 70% of them right. For a 10 items quiz, calculate the probability that Ram will get

a. at least 8 items right

b. less than 3 items right

**Q.no.37.** Five fair coins are tossed 100 times. From the following data fit the appropriate distribution and find the expected frequencies;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. of heads | 0 | 1 | 2 | 3 | 4 | 5 |
| Observed frequencies | 2 | 10 | 24 | 38 | 18 | 8 |

**Q.no.38.** A test was given to five students taken at random from three college of a city. The score of students are given below;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College A | 9 | 7 | 6 | 5 | 8 |
| College B | 7 | 4 | 5 | 4 | 5 |
| College C | 6 | 5 | 6 | 7 | 6 |

Carry out ANOVA and state your conclusion.

**Q.no 39.** The following are the numbers of mistakes made in 5 successive days for 4 d technicians working for a photographic laboratory.

|  |  |  |  |
| --- | --- | --- | --- |
| **Technicians** | | | |
| **I** | **II** | **III** | **IV** |
| 6 | 14 | 10 | 9 |
| 14 | 9 | 12 | 12 |
| 10 | 12 | 7 | 8 |
| 8 | 10 | 15 | 10 |
| 11 | 14 | 11 | 11 |

Test at 5 % level of significance whether the differences among the 4-sample means can be attributed due to chance.

**Q.no 40.** An experiment was conducted to determine the effects of different dates of planting and different methods of planting on the yield of sugarcanes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Methods of Planting** | **Date of Planting** | | | |
| **Oct** | **Nov** | **Feb** | **Mar** |
| **I** | 7 | 4 | 5 | 2 |
| **II** | 10 | 5 | 5 | 3 |
| **III** | 8 | 4 | 5 | 2 |

Does the method of planting affect the mean yield and date of planting affect mean yield? At 5 % level of significance.