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B.COM. PART 1

CORE CONCEPT OF BUSINESS MATHMATICS & STATISTICS

a) Regression equation of x on y-   **(b) Regression equation of y on x-**

$$(x-\bar{x}) = \frac{\Sigma dxdy * N - (\Sigma dx * \Sigma dy)}{\Sigma dy\,2 * N - (\Sigma dy)2}(y-\bar{y})$$ $$(y-\bar{y}) = \frac{\Sigma dxdy * N - (\Sigma dx * \Sigma dy)}{\Sigma dx\,2 * N - (\Sigma dx)2}(x-\bar{x})$$

$$(x-74.13) = \frac{1444*8 - (-7*103)}{3035*8 - (103)2}(y-126.88)$$ $$(y-126.88) = \frac{1444*8 - (-7*103)}{1523*8 - (-7)2}(x-74.13)$$

$$(x-74.13) = \frac{11552 + 721}{24280 - 10609}(y-126.88)$$ $$(y-126.88) = \frac{11552 + 721}{12184 - 49}(x-74.13)$$

$$(x-74.13) = \frac{12273}{13671}(y-126.88)$$ $$(y-126.88) = \frac{12273}{12135}(x-74.13)$$

$$(x-74.13) = 0.898\,(y-126.88)$$ $$(y-126.88) = 1.011(x-74.13)$$

$$x-74.13 = 0.898\,y-113.94$$ $$y-126.88 = 1.011x - 74.95$$

$$x = 0.898\,y-113.94+74.13$$ $$y = 1.011x - 74.95 + 126.88$$

x = 0.898 y-39.81   **y = 1.011x − 51.93**

Value of X, when Y=6

$$x = 0.898*6-39.81$$

$$x = 5.388-39.81$$

x = -34.42

Regression Coefficient-

   a) **Regression coefficient of x on y-**   (b) **Regression coefficient of y on x-**

$$b_{xy} = \frac{\Sigma dxdy * N - (\Sigma dx * \Sigma dy)}{\Sigma dy\,2 * N - (\Sigma dy)2}$$ $$b_{yx} = \frac{\Sigma dxdy * N - (\Sigma dx * \Sigma dy)}{\Sigma dx\,2 * N - (\Sigma dx)2}$$

PROBABILITY

It is remarkable that a science, which began with the consideration of games of chance, should be elevated to the rank of the most important subject of human knowledge. —Pierre Simon Laplace

Introduction In everyday life, we come across statements such as

(1) It will probably rain today.

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(2) I doubt that he will pass the test.

(3) Most probably, Kavita will stand first in the annual examination.

(4) Chances are high that the prices of diesel will go up.

(5) There is a 50-50 chance of India winning a toss in today's match.

The words 'probably', 'doubt', 'most probably', 'chances', etc., used in the statements above involve an element of uncertainty. For example,

(1), 'probably rain' will mean it may rain or may not rain today. We are predicting rain today based on our past experience when it rained under similar conditions. Similar predictions are also made in other cases listed in (2) to (5). The uncertainty of 'probably' etc can be measured numerically by means of 'probability' in many cases. Though probability started with gambling, it has been used extensively in the fields of Physical Sciences, Commerce, Biological Sciences, Medical Sciences, Weather Forecasting, etc.

CONCEPT OF PROBABILITY

The dictionary meaning of the term probability is "likely though not certain to occur."

Probability of given event is an expression of likelihood or chance of occurrence of an event. A probability is a number which range from 0 to 1. 0 for an event cannot occur and 1 for an event certain to occur.

Definition- "Probability is the limit of the relative frequency of successes in an infinite sequence of trials." – **Croxton and Cowden**

Classical Probability- This gives us the formula for classical probability. The probability of an event occurring is the number in the event divided by the number in the sample space. Again, this is only true when the events are equally likely. A classical probability is the relative frequency of each event in the sample space when each event is equally likely.

Probability of occurring an event (p) = No. of Favorable Events/ Total No. of Likely Event

For example, if there are 4 red and 5 white balls in a bag, the probability of the ball being red, in case of one ball is drawn, will be 4/9, because the number of favorable events is 4 and the total number of likely event is 9.

Empirical or Statistical Approach of Probability- It is also known as 'Relative Frequency Probability'. According to this approach probability is computed on the basis of available data or frequencies or past experiences.

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