MCQ of REGRESSION AND CORRELATION

MCQ 14.1
A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called:
(a) Correlation **(b) Regression** (c) Residual (d) Slope

MCQ 14.2
The method of least squares dictates that we choose a regression line where the sum of the square of deviations of the points from the lie is:
(a) Maximum **(b) Minimum** (c) Zero (d) Positive

MCQ 14.3
A relationship where the flow of the data points is best represented by a curve is called:
(a) Linear relationship (b) Nonlinear relationship (c) Linear positive (d) Linear negative

MCQ 14.4
All data points falling along a straight line is called:
(a) Linear relationship (b) Non linear relationship (c) Residual (d) Scatter diagram

MCQ 14.5
The value we would predict for the dependent variable when the independent variables are all equal to zero is called:
(a) Slope (b) Sum of residual **(c) Intercept** (d) Difficult to tell

MCQ 14.6
The predicted rate of response of the dependent variable to changes in the independent variable is called:
(a) Slope (b) Intercept (c) Error (d) Regression equation

MCQ 14.7
The slope of the regression line of Y on X is also called the:
(a) Correlation coefficient of X on Y (b) Correlation coefficient of Y on X
(c) Regression coefficient of X on Y **(d) Regression coefficient of Y on X**

MCQ 14.8
In simple linear regression, the numbers of unknown constants are:
(a) One **(b) Two** (c) Three (d) Four

MCQ 14.9
In simple regression equation, the numbers of variables involved are:
(a) 0 (b) 1 **(c) 2** (d) 3

MCQ 14.10
If the value of any regression coefficient is zero, then two variables are:
(a) Qualitative (b) Correlation (c) Dependent **(d) Independent**

MCQ 14.11
The straight line graph of the linear equation $Y = a + bX$, slope will be upward if:
(a) $b = 0$ (b) $b < 0$ **(c) $b > 0$** (b) $b \neq 0$

MCQ 14.12
The straight line graph of the linear equation $Y = a + bX$, slope will be downward If:
(a) $b > 0$ **(b) $b < 0$** (c) $b = 0$ (d) $b \neq 0$

MCQ 14.13
The straight line graph of the linear equation Y = a + bX, slope is horizontal if:
(a) b = 0 (b) $b \neq 0$ (c) $b = 1$ (d) a = b

MCQ 14.14
If regression line of $\widehat{Y} = 5$, then value of regression coefficient of Y on X is:
(a) 0 (b) 0.5 (c) 1 (d) 5

MCQ 14.15
If Y = 2 - 0.2X, then the value of Y intercept is equal to:
(a) -0.2 **(b) 2** (c) 0.2X (d) All of the above

MCQ 14.16
If one regression coefficient is greater than one, then other will he:
(a) More than one (b) Equal to one **(c) Less than one** (d) Equal to minus one

MCQ 14.17
To determine the height of a person when his weight is given is:
(a) Correlation problem (b) Association problem **(c) Regression problem** (d) Qualitative problem

MCQ 14.18
The dependent variable is also called:
(a) Regression **(b) Regressand** (c) Continuous variable (d) Independent

MCQ 14.19
The dependent variable is also called:
(a) Regressand variable (b) Predictand variable (c) Explained variable **(d) All of these**

MCQ 14.20
The independent variable is also called:
(a) Regressor (b) Regressand (c) Predictand (d) Estimated

MCQ 14.21
In the regression equation Y = a+bX, the Y is called:
(a) Independent variable **(b) Dependent variable** (c) Continuous variable (d) None of the above

MCQ 14.22
In the regression equation X = a + bY, the X is called:
(a) Independent variable **(b) Dependent variable** (c) Qualitative variable (d) None of the above

MCQ 14.23
In the regression equation Y = a +bX, **a** is called:
(a) X-intercept **(b) Y-intercept** (c) Dependent variable (d) None of the above

MCQ 14.24
The regression equation always passes through:
(a) (X, Y) (b) (a, b) **(c) $(\bar{X}, \bar{Y})$** (d) $(\bar{X}, Y)$

MCQ 14.25
The independent variable in a regression line is:
(a) Non-random variable (b) Random variable (c) Qualitative variable (d) None of the above

MCQ 14.26
The graph showing the paired points of (X_i, Y_i) is called:
(a) Scatter diagram (b) Histogram (c) Historigram (d) Pie diagram

MCQ 14.27
The graph  represents the relationship that is:
(a) Linear (b) Non linear (c) Curvilinear (d) No relation

MCQ 14.28
The graph  represents the relationship that is.:
(a) Linear positive **(b) Linear negative** (c) Non-linear (d) Curvilinear

MCQ 14.29
When regression line passes through the origin, then:
(a) Intercept is zero (b) Regression coefficient is zero (c) Correlation is zero (d) Association is zero

MCQ 14.30
When b_{XY} is positive, then b_{yx} will be:
(a) Negative **(b) Positive** (c) Zero (d) One

MCQ 14.31
The correlation coefficient is the_____of two regression coefficients:
(a) Geometric mean (b) Arithmetic mean (c) Harmonic mean (d) Median

MCQ 14.32
When two regression coefficients bear same algebraic signs, then correlation coefficient is:
(a) Positive (b) Negative **(c) According to two signs** (d) Zero

MCQ 14.33
It is possible that two regression coefficients have:
(a) Opposite signs **(b) Same signs** (c) No sign (d) Difficult to tell

MCQ 14.34
Regression coefficient is independent of:
(a) Units of measurement (b) Scale and origin **(c) Both (a) and (b)** (d) None of them

MCQ 14.35
In the regression line Y = a+ bX:
(a) $\sum X = \sum \hat{X}$ **(b)** $\sum \boldsymbol{Y} = \sum \boldsymbol{\hat{Y}}$ (c) $\sum X = \sum Y$ (d) $X = Y$

MCQ 14.36
In the regression line Y = a + bX, the following is always true:
(a) $\sum(X - \hat{X}) = 0$ **(b)** $\sum(\boldsymbol{Y} - \boldsymbol{\hat{Y}}) = \mathbf{0}$ (c) $\sum(X - \hat{X}) = \sum(Y - \hat{Y})$ (d) $\sum(Y - \hat{Y})^2 = 0$

MCQ 14.37
The purpose of simple linear regression analysis is to:
(a) Predict one variable from another variable
(b) Replace points on a scatter diagram by a straight-line
(c) Measure the degree to which two variables are linearly associated
(d) Obtain the expected value of the independent random variable for a given value of the dependent variable

MCQ 14.38
The sum of the difference between the actual values of Y and its values obtained from the fitted regression line is always:
(a) Zero (b) Positive (c) Negative (d) Minimum

MCQ 14.39
If all the actual and estimated values of Y are same on the regression line, the sum of squares of error will be:
(a) Zero (b) Minimum (c) Maximum (d) Unknown

MCQ 14.40
$e_i = Y_i - \widehat{Y}_i$ *is called*:
(a) Residual (b) Difference between independent and dependent variables
(c) Difference between slope and intercept (d) Sum of residual

MCQ 14.41
A measure of the strength of the linear relationship that exists between two variables is called:
(a) Slope (b) Intercept **(c) Correlation coefficient** (d) Regression equation

MCQ 14.42
When the ratio of variations in the related variables is constant, it is called:
(a) Linear correlation (b) Nonlinear correlation (c) Positive correlation (d) Negative correlation

MCQ 14.43
If both variables X and Y increase or decrease simultaneously, then the coefficient of correlation will be:
(a) Positive (b) Negative (c) Zero (d) One

MCQ 14.44
If the points on the scatter diagram indicate that as one variable increases the other variable tends to decrease the value of r will be:
(a) Perfect positive (b) Perfect negative **(c) Negative** (d) Zero

MCQ 14.45
If the points on the scatter diagram show no tendency either to increase together or decrease together the value of **r** will be close to:
(a) -1 (b) +1 (c) 0.5 **(d) 0**

MCQ 14.46
If one item is fixed and unchangeable and the other item varies, the correlation coefficient will be:
(a) Positive (b) Negative **(c) Zero** (d) Undecided

MCQ 14.47
In scatter diagram, if most of the points lie in the first and third quadrants, then coefficient of correlation is:
(a) Negative **(b) Positive** (c) Zero (d) All of the above

MCQ 14.48
If the two series move in reverse directions and the variations in their values are always proportionate, it is said to be:
(a) Negative correlation (b) Positive correlation
(c) Perfect negative correlation (d) Perfect positive correlation

MCQ 14.49
If both the series move in the same direction and the variations are in a fixed proportion, correlation between them is said to be:
(a) Perfect correlation (c) Linear correlation
(c) Nonlinear correlation **(d) Perfect positive correlation**

MCQ 14.50
The value of the coefficient of correlation r lies between:
(a) 0 and 1 (b) -1 and 0 **(c) -1 and +1** (d) -0.5 and +0.5

MCQ 14.51
If X is measured in yours and Y is measured in minutes, then correlation coefficient has the unit:
(a) Hours (b) Minutes (c) Both (a) and (b) **(d) No unit**

MCQ 14.52
The range of regressioin coefficient is:
(a) -1 to +1 (b) 0 to 1 **(c) $-\infty$ to $+\infty$** (d) 0 to ∞

MCQ 14.53
The signs of regression coefficients and correlation coefficient are always:
(a) Different **(b) Same** (c) Positive (d) Negative

MCQ 14.54
The arithmetic mean of the two regression coefficients is greater than or equal to:
(a) -1 (b) +1 (c) 0 **(d) r**

MCQ 14.55
In simple linear regression model $Y = \alpha + \beta X + \varepsilon$ where α and β are called:
(a) Estimates **(b) Parameters** (c) Random errors (d) Variables

MCQ 14.56
Negative regression coefficient indicates that the movement of the variables are in:
(a) Same direction **(b) Opposite direction** (c) Both (a) and (b) (d) Difficult to tell

MCQ 14.57
Positive regression coefficient indicates that the movement of the variables are in:
(a) Same direction (b) Opposite direction (c) Upward direction (d) Downward direction

MCQ 14.58
If the value of regression coefficient is zero, then the two variable are called:
(a) Independent (b) Dependent **(c) Both (a) and (b)** (d) Difficult to tell

MCQ 14.59
The term regression was used by:
(a) Newton (b) Pearson (c) Spearman **(d) Galton**

MCQ 14.60
In the regression equation $Y = a + bX$, b is called:
(a) Slope (b) Regression coefficient (c) Intercept **(d) Both (a) and (b)**

MCQ 14.61
When the two regression lines are parallel to each other, then their slopes are:
(a) Zero (b) Different **(c) Same** (d) Positive

MCQ 14.62
The measure of change in dependent variable corresponding to an unit change in independent variable is called:
(a) Slope (b) Regression coefficient **(c) Both (a) and (b)** (d) Neither (a) and (b)

MCQ 14.63
In correlation problem both variables are:
(a) Equal (b) Unknown (c) Fixed **(d) Random**

MCQ 14.64
In the regression equation Y = a + bX, where a and b are called:
(a) Constants (b) Estimates (c) Parameters **(d) Both (a) and (b)**

MCQ 14.65
If $b_{yx} = b_{xy} = 1$ and $S_x = S_y$, then **r** will be:
(a) 0 (b) -1 **(c) 1** (d) Difficult to calculate

MCQ 14.66
The correlation coefficient between X and -X is:
(a) 0 (b) 0.5 (c) 1 **(d) -1**

MCQ 14.67
If $b_{yx} = b_{xy} = r_{xy}$, then:
(a) $S_x \neq S_y$ **(b) $S_x = S_y$** (c) $S_x > S_y$ (d) $S_x < S_y$

MCQ 14.68
If $r_{xy} = 0.4$, then $r_{(2x, 2y)}$ is equal to:
(a) 0.4 (b) 0.8 (c) 0 (d) 1

MCQ 14.69
r_{xy} is equal to:
(a) 0 (b) -1 **(c) 1** (d) 0.5

MCQ 14.70
If $r_{xy} = 0.75$, then correlation coefficient between u = 1.5X and v = 2Y is:
(a) 0 **(b) 0.75** (c) -0.75 (d) 1.5

MCQ 14.71
If $b_{yx} = -2$ and $r_{xy} = -1$, then b_{xy} is equal to:
(a) -1 (b) -2 (c) 0.5 **(d) -0.5**

MCQ 14.72
If $b_{yx} = 1.6$ and $b_{xy} = 0.4$, then r_{xy} will be:
(a) 0.4 (b) 0.64 **(c) 0.8** (d) -0.8

MCQ 14.73
If $b_{yx} = -0.8$ and $b_{xy} = -0.2$, then r_{yx} is equal to:
(a) -0.2 **(b) -0.4** (c) 0.4 (d) -0.8

MCQ 14.74
If $\widehat{Y} = 6 - X$, then **r** will be:
(a) 0 (b) 1 **(c) -1** (d) Both (b) and (c)

MCQ 14.75
If $\widehat{Y}$ = X + 10, then **r** equal to:
(a) 1 (b) -1 (c) 1/2 (d) Difficult to tell

MCQ 14.76
If Y = -10X and X = -0.1Y, then **r** is equal to:
(a) 0.1 (b) 1 **(c) -1** (d) 10

MCQ 14.77
If the figure +1 signifies perfect positive correlation and the figure -1 signifies a perfect negative correlation, then the figure 0 signifies:
(a) A perfect correlation **(b) Uncorrelated variables**
(c) Not significant (d) Weak correlation

MCQ 14.78
A perfect positive correlation is signified by:
(a) 0 (b) -1 **(c) +1** (d) -1 to +1

MCQ 14.79
If a statistics professor tells his class: "All those who got 100 on the statistics test got 20 on the mathematics test, and all those that got 100 on the mathematics test got 20 on the statistics test", he is saying that the correlation between the statistics test and the mathematics test is:
(a) Negative (b) Positive (c) Zero (d) Difficult to tell

MCQ 14.80
If $\sum(X - \overline{X})(Y - \overline{Y})$ is zero, the correlation is:
(a) Weak negative (b) High positive (c) High negative **(d) None of the preceding**

MCQ 14.81
If r_{xy} = 1, then:
(a) $b_{yx} = b_{xy}$ (b) $b_{yx} > b_{xy}$ (c) $b_{yx} < b_{xy}$ **(d) $b_{yx} . b_{xy} = 1$**

MCQ 14.82
The relation between the regression coefficient b_{yx} and correlation coefficient r is:
(a) $\frac{S_y}{S_x}$ (b) $\frac{S_x}{S_y}$ (c) $r\frac{S_x}{S_y}$ (**d**) $\mathbf{r\frac{S_y}{S_x}}$

MCQ 14.83
The relation between the regression coefficient b_{xy} and correlation coefficient r is:
(a) $\frac{b_{xy}}{r} = \frac{S_x}{S_y}$ (b) $b_{xy} = r\frac{S_x}{S_y}$ (c) $b_{xy}.S_y = r.S_x$ (**d**) **All of the above**

MCQ 14.84
If the sum of the product of the deviation of X and Y from their means is zero, the correlation coefficient between X and Y is:
(a) Zero (b) Maximum (c) Minimum (d) Undecided

MCQ 14.85
If the coefficient of correlation between the variables X and Y is r, the coefficient of correlation between X^2 and Y^2 is:
(a) -1 (b) 1 (c) r **(d) r^2**

MCQ 14.86
If r_{xy} = 0.75, then r_{xy} will be:
(a) 0.25 (b) 0.50 **(c) 0.75** (d) -0.75

MCQ 14.87
If $\widehat{Y} = a$, then b_{yx} is equal to:
(a) Positive (b) Negative **(c) Zero** (d) One

MCQ 14.88
If $\widehat{Y} = bX$, then intercept a is equal to:
(a) 0 (b) 1 (c) -1 to +1 (d) 0 to 1

MCQ 14.89
$E(Y - \widehat{Y})$ *will be*:
(a) Less than zero (b) Greater than zero **(c) Equal to zero** (d) Not equal to zero

MCQ 14.90
When $r_{xy} < 0$, then b_{yx} and b_{xy} will be:
(a) Zero (b) Not equal to zero **(c) Less than zero** (d) Greater than zero

MCQ 14.91
When $r_{xy} > 0$, then b_{yx} and b_{xy} are both:
(a) 0 (b) < 0 **(c) > 0** (d) < 1

MCQ 14.92
If $r_{xy} = 0$, then:
(a) $b_{yx} = 0$ (b) $b_{xy} = 0$ **(c) Both (a) and (b)** (d) $b_{yx} \neq b_{xy}$

MCQ 14.93
If $b_{xy} = 0.20$ and $r_{xy} = 0.50$, then b_{yx} is equal to:
(a) 0.20 (b) 0.25 (c) 0.50 **(d) 1.25**

MCQ 14.94
A regression model may be:
(a) Linear (b) Non-linear **(c) Both (a) and (b)** (d) Neither (a) and (b)

MCQ 14.95
If **r** is negative, we know that:
(a) $\sum(X - \overline{X})^2$ *and* $\sum(X - \overline{X})(Y - \overline{Y})$ *are negative*
(b) $\sum(Y - \overline{Y})^2$ *and* $\sum(X - \overline{X})(Y - \overline{Y})$ *are negative*
(c) $\boldsymbol{\sum(X - \overline{X})(Y - \overline{Y})}$ ***is negative***
(d) *Either* $\sum(X - \overline{X})^2$ *or* $\sum(Y - \overline{Y})^2$ *is negative*