W – 937

Seat No.

B.C.S. (Part – I) (Semester – II) Examination, 2011
STATISTICS (Paper – III)
(Descriptive Statistics – II)

Day and Date : Saturday, 30-4-2011 Total Marks : 40

Time : 3.00 p.m. to 5.00 p.m.

Instructions : *1) **All** questions are **compulsory**.*
*2) **Use** of calculators and statistical tables is **allowed**.*
*3) Figure to **right** in the bracket indicate **full** marks.*

1. Choose the **correct** alternative : **(8)**

i) For symmetric distribution, the value of μ_3 is

a) equal to 3 b) positive c) zero d) negative

ii) For a positively skewed distribution

a) mean = median = mode b) median < mean < mode

c) mean < median < mode d) mode < median < mean

iii) If correlation coefficient between X and Y is 0.75, then correlation coefficient between – X+2 and Y+1 is

a) 0.75 b) – 0.75 c) 1.75 d) 0

iv) If the variables X and Y changes in same direction then cov (X, Y) is

a) zero b) one c) positive d) negative

v) If one regression coefficient is greater than one, then the other must be

a) less than one b) greater than one

c) equal to one d) none of these

vi) The term 'regression' is first introduced by

a) R.A. Fisher b) Sir Francis Galton

c) Karl Pearson d) Spearman

vii) A measure of extent of linear relationship between X_1 with other variables X_2 and X_3 is given by

a) Simple correlation b) Partial correlation

c) Multiple correlation d) Simple regression

viii) The residual $X_{1.23}$ is called as residual of order

a) 0 b) 1 c) 2 d) 3

2. Attempt **any two** of the following three : **(8+8)**

i) Define Karl Pearson's correlation coefficient. Show that it lies between -1 and $+1$.

ii) Define regression coefficients. State and prove any two properties of regression coefficients.

iii) Given for a trivariate data

$\sigma_1 = 3,\ \sigma_2 = \sigma_3 = 4,\ r_{12} = 0.7,\ r_{13} = r_{23} = 0.6$

Obtain i) $r_{23.1}$

ii) $R_{2.31}$

iii) $\sigma_{2.13}$

3. Attempt **any four** of the following : **(4+4+4+4)**

i) Write a short note on Kurtosis.

ii) Show that $\beta_2 \geq 1$.

iii) Find the number of pairs of observations from the following information.

$r = -0.4,\ \Sigma x = 100,\ \Sigma x^2 = 2250,\ \Sigma y = 100,\ \Sigma y^2 = 2250$ and $\Sigma xy = 1900$.

iv) $4y = x - 5$ and $16y = x + 64$ are the lines of regression. Find the coefficient of correlation between x and y.

v) In a trivaviate data $r_{12} = 0.6,\ r_{13} = -0.4,\ r_{23} = -0.7$. Are these values consistent ?

vi) If $r_{12.3} = 0$ Show that $r_{13.2} = r_{13}\ \dfrac{\sqrt{1 - r_{23}^2}}{1 - r_{12}^2}$.

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Total No. of Pages : 3

Seat No.	

B.C.S. (Part - I) (Semester - II) Examination, 2013

STATISTICS (Paper - III)

Descriptive Statistics - II

Sub. Code : 58180

Day and Date : Saturday, 04 - 05 - 2013 **Total Marks : 50**

Time : 3.00 p.m. to 5.00 p.m.

Instructions : 1) All questions are compulsory.
2) Use of calculators and statistical table is allowed.
2) Figures to the right in the bracket indicate full marks.

Q1) Choose the correct alternative : **[10]**

a) If $\gamma_2 < 0$, then the frequency curve is _____.
   i) mesokurtic ii) platykurtic
   iii) leptokurtic iv) any of the above

b) If $r = \pm 1$, the angle between the two lines of regression is _____.
   i) 90° ii) 45°
   iii) 0° iv) 30°

c) If there exists perfect correlation between X and Y then correlation coefficient (r) is _____.
   i) 0 ii) 1
   iii) –1 iv) –1 or +1

d) If $byx = -\left(\frac{1}{4}\right)$ and $bxy = -1$ then correlation coefficient (r) is _____.
   i) $\frac{1}{4}$ ii) $-\frac{1}{4}$
   iii) $\frac{1}{2}$ iv) $-\frac{1}{2}$

e) Given two regression lines as $X + 4Y - 8 = 0$ and $X - 2Y + 4 = 0$ then Mean $(\overline{X}, \overline{Y})$ of X and Y are _____.
   i) (4, 5) ii) (2, 1)
   iii) (4, 1) iv) (0, 2)

P.T.O.

f) For a platykurtic curve _____.
   i) $\gamma_2 < 0$ ii) $\gamma_2 > 0$
   iii) $\gamma_2 = 0$ iv) $\beta_2 < 3$

g) The partial regression coefficient $b_{12.3}$ is of order _____.
   i) one ii) two
   iii) zero iv) three

h) Expenditure on Advertisement and scale have _____.
   i) Positive correlation ii) Negative correlation
   iii) Perfect Negative correlation iv) No correlation

i) Correlation coefficient always lies between _____.
   i) 0 to 1 ii) –1 to 1
   iii) 0 to ∞ iv) $-\infty$ to ∞

j) Given that, Mean = 1, Variance = 3 and $\mu_3 = 0$ then given distribution is _____.
   i) positively skewed ii) negatively skewed
   iii) symmetric iv) leptokurtic

Q2) Attempt any two of the following : **[10 + 10 = 20]**

a) When are two Variables said to be correlated? Describe scatter diagram and explain its utility in the study of correlation.

b) Define multiple and partial correlation coefficient for a trivariate data. State their limits. State the necessary and sufficient condition for the three regression planes to coincide.

c) Derive the two equations of lines of regression by using least square method.

Q3) Attempt any four of the following : **[5 + 5 + 5 + 5 = 20]**

a) State the properties of regression coefficients.

b) If $R_{1.23} = 1$, then show that $R_{2.13} = 1 = R_{3.12}$.

c) If correlation coefficient between two random variables X and Y is 0.8, find the correlation coefficient between

   i) 12X and 10Y ii) $\frac{X-12}{S}$ and $\frac{12-Y}{S}$

   iii) $\frac{X}{12}$ and $\frac{Y}{12}$

   Justify your answer.

d) Compute regression coefficient from the following data.

$n = 8$, $\Sigma(X-45) = -40$, $\Sigma(X-45)^2 = 4400$

$\Sigma(Y-150) = 280$, $\Sigma(Y-150)^2 = 167432$,

$\Sigma(X-45)(Y-150) = 21680$

e) Describe scatter diagrams.

f) Explain the term Kurtosis.

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Seat No.	

Total No. of Pages : 3

B.C.S. (Part - I) (Semester - II) Examination, November - 2015

STATISTICS (Paper - III)

Descriptive Statistics

Sub. Code : 59710

Day and Date :Friday, 20 - 11 - 2015 **Total Marks :50**

Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are Compulsory.**
2) **Figures to right indicate Full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative. **[10]**

i) If the correlation coefficient between X and Y is –0.65 the correlation coefficient between 4 + 2X and 3Y + 1 is _____.

a) 0.65 b) 0.35

c) –0.65 d) –0.35

ii) If one regression coefficient is greater than one, then other must be_____.

a) less than one b) greater than one

c) equal to one d) none of these

iii) A measure of extent of linear relationship between X_1 with X_2 and X_3 is given by_____.

a) simple correlation b) partial correlation

c) multiple correlation d) simple regression

iv) The Karl Pearson's correlation coefficient is_____ of regression coefficients.

a) A.M. b) H.M.

c) G.M. d) median

v) Spearman's rank correlation coefficient is equal to one if_____.

a) $\sum di^2 = 0$ b) $\sum di^2 > 0$

c) $\sum di^2 < 0$ d) none of these

vi) The residual $X_{1.23}$ is called as residual of order_____.

a) 0 b) 1

c) 2 d) 3

vii) If $R_{1.23} = 0$ then values of r_{12} and r_{13} are _____ respectively.

a) 0 and 1 b) 1 and 0

c) 0 and 0 d) 1 and 1

viii) Which of the following coefficient lies between –1 to 1.

a) simple correlation coefficient b) rank correlation coefficient

c) partial correlation coefficient d) all of these

ix) The two regression equations intersect at_____.

a) (0,0) b) $(\bar{X}, \bar{Y})$

c) (b_{yx}, b_{xy}) d) $(0, \bar{Y})$

x) If there exit perfect correlation between X and Y then correlation coefficient 'r' is_____.

a) 1 b) 0

c) –1 d) –1 or 1

Q2) Attempt **any two** of following. [20]

a) Define Karl Pearson coefficient of correlation, State and prove any two properties of the same.

b) Derive the equation of regression line of Y on X by method of least square.

c) Define multiple and partial correlation coefficient for trivariate data. State their limits and necessary and sufficient condition for the three regression planes coincide.

Q3) Attempt **any four** of the following. **[20]**

a) Write a note on scatter diagram.

b) Define regression coefficients. State properties of regression coefficients.

c) In a trivariate data $r_{12} = 0.6$, $r_{13} = 0.4$ and $r_{23} = 0.5$ are these values consistent.

d) If correlation coefficient between x and y is 0.7 calculate correlation coefficient between.

i) $x + 10$ and $y - 20$

ii) $2x$ and $4y$

iii) $\frac{10-x}{3}$ and $\frac{y+20}{5}$

e) If x and y are uncorrelated variables and var(x) = k, var(y) = 2. Find value of k such that var $(3x - y) = 25$.

f) If $r_{12} = r_{13} = r_{23} = \rho$ show that $R^2_{1.23} = \frac{2\rho^2}{1+\rho}$

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Total No. of Pages : 3

Seat No.	

B.C.S. (Part - I) (Semester - II) Examination, November - 2015

STATISTICS (Paper - III)

Descriptive Statistics

Sub. Code : 59710

Day and Date :Friday, 20 - 11 - 2015 **Total Marks :50**

Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are Compulsory.**
2) **Figures to right indicate Full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative. **[10]**

i) If the correlation coefficient between X and Y is –0.65 the correlation coefficient between 4 + 2X and 3Y + 1 is _____.

a) 0.65 b) 0.35

c) –0.65 d) –0.35

ii) If one regression coefficient is greater than one, then other must be_____.

a) less than one b) greater than one

c) equal to one d) none of these

iii) A measure of extent of linear relationship between X_1 with X_2 and X_3 is given by_____.

a) simple correlation b) partial correlation

c) multiple correlation d) simple regression

iv) The Karl Pearson's correlation coefficient is_____ of regression coefficients.

a) A.M. b) H.M.

c) G.M. d) median

v) Spearman's rank correlation coefficient is equal to one if_____.

a) $\sum di^2 = 0$ b) $\sum di^2 > 0$

c) $\sum di^2 < 0$ d) none of these

vi) The residual $X_{1.23}$ is called as residual of order_____.

a) 0 b) 1

c) 2 d) 3

vii) If $R_{1.23} = 0$ then values of r_{12} and r_{13} are _____ respectively.

a) 0 and 1 b) 1 and 0

c) 0 and 0 d) 1 and 1

viii) Which of the following coefficient lies between –1 to 1.

a) simple correlation coefficient b) rank correlation coefficient

c) partial correlation coefficient d) all of these

ix) The two regression equations intersect at_____.

a) (0,0) b) $(\bar{X}, \bar{Y})$

c) (b_{yx}, b_{xy}) d) $(0, \bar{Y})$

x) If there exit perfect correlation between X and Y then correlation coefficient 'r' is_____.

a) 1 b) 0

c) –1 d) –1 or 1

Q2) Attempt **any two** of following. [20]

a) Define Karl Pearson coefficient of correlation, State and prove any two properties of the same.

b) Derive the equation of regression line of Y on X by method of least square.

c) Define multiple and partial correlation coefficient for trivariate data. State their limits and necessary and sufficient condition for the three regression planes coincide.

Q3) Attempt **any four** of the following. [20]

a) Write a note on scatter diagram.

b) Define regression coefficients. State properties of regression coefficients.

c) In a trivariate data $r_{12} = 0.6$, $r_{13} = 0.4$ and $r_{23} = 0.5$ are these values consistent.

d) If correlation coefficient between x and y is 0.7 calculate correlation coefficient between.

i) $x + 10$ and $y - 20$

ii) $2x$ and $4y$

iii) $\frac{10-x}{3}$ and $\frac{y+20}{5}$

e) If x and y are uncorrelated variables and var(x) = k, var(y) = 2. Find value of k such that var $(3x - y) = 25$.

f) If $r_{12} = r_{13} = r_{23} = \rho$ show that $R^2_{1.23} = \frac{2\rho^2}{1+\rho}$

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Seat No.	

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Total No. of Pages : 3

B.C.S. (Part - I) (Semester - II) Examination, April - 2016

STATISTICS

Descriptive Statistics - II (Paper - III)

Sub. Code : 59710

Day and Date : Monday, 11 - 04 - 2016
Time : 12.00 noon to 2.00 p.m.

Total Marks : 50

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative: **[10]**

a) If the variables X and Y change in the same direction, then correlation between X and Y is_____.
   i) Zero
   ii) 1
   iii) Positive
   iv) Nagative

b) Given the two regression equations as X+4Y-8=0 and X-2Y+4=0, then means of X and Y are_____.
   i) (4, 5)
   ii) (2, 1)
   iii) (4, 1)
   iv) (0, 2)

c) A measure of extent of linear relationship between X_1 with the other Varibles X_2 and X_3 is given by_____.
   i) Simple correlation
   ii) Partial correlation
   iii) Multiple correlation
   iv) Multiple regression

d) If the correlation coefficient r =0, then the two regression lines are_____.
   i) Perpendicular to each other
   ii) Coincide
   iii) Parallel to each other
   iv) Do not exist

P.T.O.

e) If $r_{12}=r_{13}=0$ then the multiple correlation coefficient $R_{1.23}$ = _____.

i) -1 ii) 1

iii) 0 iv) None of these

f) If correlation coefficient between X and Y is 0.8 then correlation between -X and -Y is_____.

i) -0.8 ii) 0.8

iii) 0.64 iv) 0.4

g) If b_{yx} = -1/9 and b_{xy} = -1 then correlation coefficient r is_____.

i) -1/9 ii) 1/9

iii) 1/3 iv) -1/3

h) Which of the following coefficient have range – 1 to 1?

i) Simple correlation coefficient

ii) Rank correlation coefficient

iii) Partial correlation coefficient

iv) All the above

i) If rank correlation coefficient is equal to 1, it means that:

i) All differences of ranks are nonzero

ii) Ranks in each pair are equal

iii) Ranks in each pair are not equal

iv) None of these

j) If X and Y are uncorrelated variables, then Var(X –Y)=_____.

i) Var (X)+Var (Y)

ii) Var (X)–Var (Y)

iii) Var (X)+Var (Y)+2cov (X,Y)

iv) None of these

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Q2) Attempt any two of the follwing: **[20]**

a) Define regression. Derive the regression equation Y on X using least square method.

b) Define Karl Pearson correlation coefficient. State and prove any two properties of correlation coefficient.

c) For a trivariate data on X_1, X_2, X_3 is as follows:

$\text{mean}(X_1)= 15.9$, $\text{mean}(X_2)= 3.67$, $\text{mean}(X_3)= 5.97$

$\sigma_1 = 1.71$, $\sigma_2 = 1.29$, $\sigma_3 = 3.09$

$r_{12}= -0.66$, $r_{13}=-0.13$, $r_{23}=0.6$

Obtain the equation of plane of regression of X_2 on X_1 and X_3. Also estimate X_2 when $X_1=14$ and $X_3=6$.

Q3) Attempt any four of the following: **[20]**

a) Write a note on scatter diagram.

b) Discuss the effect of change of origin and scale on regression coefficients.

c) If $r_{12}= r_{13}= r_{23}=\rho$, then show that $R^2_{1.23} = \frac{2\rho^2}{1+\rho}$.

d) Spearman's rank correlation coefficient between X and Y is 2/3. The sum of squares of difference between ranks is 55, assuming that no rank is repeated, find numbers of pairs in the series.

e) Is the following data consistent?

$r_{12}=0.6$, $r_{13}=-0.9$ $r_{23}=0.8$

f) Find correlation between X and Y from following data.

$n = 25$, $\Sigma X = 75$, $\Sigma Y = 100$, $\Sigma X^2 = 250$, $\Sigma Y^2 = 500$ $\Sigma XY = 325$.

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Total No. of Pages : 3

Seat No.	

B.C.S. (Part - I) (Semester - II) Examination, April - 2017
STATISTICS (Paper - III)
Descriptive Statistics
Sub. Code : 59710

Day and Date : Wednesday, 26 - 04 - 2017 **Total Marks : 50**

Time : 12.00 noon to 02.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figures to right indicate full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative : **[10]**

a) The concept of rank correlation was given by_____.

i) Galton ii) Kendall

iii) Spearman iv) None of these

b) Equations of two regression lines are $X + Y = 8$, $X - Y = 4$, then mean of X and Y are_____.

i) (2, 6) ii) (6, 2)

iii) (8, 4) iv) (0, 2)

c) With usual notations, the regression equation X_2 on X_1 and X_3 is_____.

i) $X_2 = b_{21.3}X_1 + b_{23.1}X_3$ ii) $X_2 = b_{12.3}X_1 + b_{13.2}X_3$

iii) $X_2 = b_{12}X_1 + b_{13}X_3$ iv) None of these

d) If two regression coefficients are –1.2 and –0.3, then the correlation coefficient is_____.

i) – 0.36 ii) – 0.6

iii) – 0.06 iv) 0.6

e) If correlation coefficient $r = \pm 1$, then the angle between two lines is_____.

i) 90° ii) 45°

iii) 0° iv) 30°

f) If rank in each pair are equal then rank correlation coefficient is_____.

i) 1 ii) –1

iii) 0 iv) None of these

P.T.O.

g) _____ correlation coefficient lies between –1 and + 1.

i) Partial ii) Rank

iii) Simple iv) All the above

h) Three multiple regression planes coincide if the determinant of correlation coefficient |R| is_____.

i) 1 ii) 0

iii) Positive iv) Negative

i) If $R_{1.23}=0$ then $r_{12}= r_{13}=$_____.

i) 1 ii) 0.5

iii) –1 iv) 0

j) If correlation coefficient between X andY is 0.8, then correlation coefficient between –X+5 and 3Y+5 is_____.

i) 0.8 ii) 0

iii) – 0.8 iv) 2.4

Q2) Attempt any two of the following : **[20]**

a) Derive the regression equation Y on X using least square method.

b) Define correlation. Explain different types and different methods to study correlation.

c) The given data related with 3 variables:

mean (X_1) =55.95, mean(X_2)=51.48, mean(X_3)=56.03, σ_1=2.26, σ_2=4.40 σ_3=4.5, r_{12}=0.56, r_{13}=0.97, r_{23}=0.58.

Find : i) the multiple regression equation X_3 on X_1 and X_2.

ii) value of X_3 when X_1=40 and X_2=45.

iii) Var $(X_{3.12})$.

[20]

Q3) Attempt any four of the following :

a) Show that correlation coefficient is geometric mean of regression coefficients.

b) Explain $r = 0$, $r = -1$ and $r = +1$ using scatter diagram.

c) Compute $R_{2.13}$, $r_{23.1}$ if $r_{12} = 0.59$, $r_{13} = 0.46$, $r_{23} = 0.77$.

d) Calculate Karl Pearson's correlation coefficient for data given below.

$n = 12$, $\Sigma x = 30$, $\Sigma y = 5$, $\Sigma x^2 = 670$, $\Sigma y^2 = 285$, $\Sigma xy = 334$

e) Discuss effect of change of origin and scale on regression coefficients.

f) Prove or disprove if $R_{1.23} = 0$ then $R_{2.13} = 0$.

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Seat No.	

Total No. of Pages : 2

B.C.S. (Part - I) (Semester - II) Examination, November - 2017

STATISTICS

Descriptive Statistics-II (Paper-III)

Sub. Code : 59710

Day and Date : Tuesday, 07 - 11 - 2017 **Total Marks : 50**

Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to right indicate full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative: **[10]**

a) If X and y are independent variables then correlation coefficient between them is _____.
   i) Maximum ii) Minimum
   iii) Zero iv) -1 or 1

b) The order of residual $X_{1.234}$ is _____.
   i) 3 ii) 2
   iii) 1 iv) None of these

c) The multiple correlation coefficient lies between _____.
   i) -1 to 1 ii) 0 to 1
   iii) 0 to ∞ iv) $-\infty$ to $+\infty$

d) If byx=-1/4 and bxy=-1 then correlation coefficient r is _____.
   i) -0.5 ii) 0.5
   iii) 0.25 iv) -0.25

e) If r=0, then angle between two regression lines is _____.
   i) 90° ii) 45°
   iii) 0° iv) 180°

f) If $R_{1.23}=1$ then $R_{2.13}$ and $R_{3.12}$= _____.
   i) 0.5 ii) 0
   iii) 1 iv) None of these

g) Given r(X, Y)=0.9, then r(2X+1, Y+3) is _____.
   i) 1.9 ii) -1.9
   iii) -0.9 iv) 0.9

h) Spearman's rank correlation coefficient (R)=1, if _____.

i) $\sum di^2 = 0$ ii) $\sum di^2 = 1$

iii) $\sum di^2 > 0$ iv) $\sum di^2 < 0$

i) The partial correlation coefficient is independent of change of _____.

i) Origin ii) Scale

iii) Origin and Scale iv) Neither origin nor scale

j) Both regression lines intersect at _____.

i) Origin ii) Mean of X and Y

iii) Right angle iv) None of these

Q2) Attempt any two of the following: **[20]**

a) What is correlation? Define Karl Pearson's correlation coefficient and show that it lies between -1 and 1.

b) Derive the equation of regression line of Y on X using least square method.

c) Explain the concept of multiple and partial regression. State three multiple regression equations for X_1, X_2 and X_3. State mean and variance of residuals for 3 equations X_1, X_2 and X_3.

Q3) Attempt any four of the following: **[20]**

a) Write a short note on scatter diagram.

b) If $r_{12}=r_{13}=r_{23}=\rho$ then show that

i) $R^2_{1.23}=2\rho^2/(1+\rho)$ ii) $r_{1.23}=\rho/(1+\rho)$

c) The regression equations are 4X-5Y+33=0 and 20X-9Y-107=0. Find

i) Regression coefficients (b_{xy} and b_{yx})

ii) r(X, Y).

d) Discuss effect of change of origin and scale on correlation coefficient (r).

e) Are the given data consistent? $r_{12}=0.6$, $r_{13}=0.7$, $r_{23}=0.65$.

f) For a bivariate data mean(x)=60, mean(y)=28, $b_{yx}=-1.5$, $b_{xy}=-0.2$. Estimate

i) value of y for x=60 ii) value of x for y=30

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Total No. of Pages : 2

Seat No.	

B.C.S. (Part - I) (Semester - II) Examination, November - 2017

STATISTICS

Descriptive Statistics-II (Paper-III)

Sub. Code : 59710

Day and Date : Tuesday, 07 - 11 - 2017 **Total Marks : 50**

Time : 3.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to right indicate full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative: **[10]**

a) If X and y are independent variables then correlation coefficient between them is _____.
   i) Maximum ii) Minimum
   iii) Zero iv) -1 or 1

b) The order of residual $X_{1.234}$ is _____.
   i) 3 ii) 2
   iii) 1 iv) None of these

c) The multiple correlation coefficient lies between _____.
   i) -1 to 1 ii) 0 to 1
   iii) 0 to ∞ iv) $-\infty$ to $+\infty$

d) If byx=-1/4 and bxy=-1 then correlation coefficient r is _____.
   i) -0.5 ii) 0.5
   iii) 0.25 iv) -0.25

e) If r=0, then angle between two regression lines is _____.
   i) 90° ii) 45°
   iii) 0° iv) 180°

f) If $R_{1.23}=1$ then $R_{2.13}$ and $R_{3.12}$= _____.
   i) 0.5 ii) 0
   iii) 1 iv) None of these

g) Given r(X, Y)=0.9, then r(2X+1, Y+3) is _____.
   i) 1.9 ii) -1.9
   iii) -0.9 iv) 0.9

h) Spearman's rank correlation coefficient (R)=1, if _____.

i) $\sum di^2 = 0$ ii) $\sum di^2 = 1$

iii) $\sum di^2 > 0$ iv) $\sum di^2 < 0$

i) The partial correlation coefficient is independent of change of _____.

i) Origin ii) Scale

iii) Origin and Scale iv) Neither origin nor scale

j) Both regression lines intersect at _____.

i) Origin ii) Mean of X and Y

iii) Right angle iv) None of these

Q2) Attempt any two of the following: **[20]**

a) What is correlation? Define Karl Pearson's correlation coefficient and show that it lies between -1 and 1.

b) Derive the equation of regression line of Y on X using least square method.

c) Explain the concept of multiple and partial regression. State three multiple regression equations for X_1, X_2 and X_3. State mean and variance of residuals for 3 equations X_1, X_2 and X_3.

Q3) Attempt any four of the following: **[20]**

a) Write a short note on scatter diagram.

b) If $r_{12}=r_{13}=r_{23}=\rho$ then show that

i) $R^2_{1.23}=2\rho^2/(1+\rho)$ ii) $r_{1.23}=\rho/(1+\rho)$

c) The regression equations are 4X-5Y+33=0 and 20X-9Y-107=0. Find

i) Regression coefficients (b_{xy} and b_{yx})

ii) r(X, Y).

d) Discuss effect of change of origin and scale on correlation coefficient (r).

e) Are the given data consistent? $r_{12}=0.6$, $r_{13}=0.7$, $r_{23}=0.65$.

f) For a bivariate data mean(x)=60, mean(y)=28, $b_{yx}=-1.5$, $b_{xy}=-0.2$. Estimate

i) value of y for x=60 ii) value of x for y=30

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B.Sc. (Computers Science) (Entire) (Part -I) (Semester - II) Examination, April - 2018

STATISTICS

Descriptive Statistics - II (Paper - III)

Sub. Code: 59710

Day and Date : Wednesday, 25 - 04 - 2018
Time :12.00 noon to 2.00 p.m.

Total Marks : 50

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of calculator and statistical table is allowed.**

Q1) Choose the correct alternative: **[10]**

a) The multiple correlation coefficient lies between _____.

i) 0 to 1 ii) -1 to 1

iii) 0 to ∞ iv) $-\infty$ to ∞

b) The correlation coefficient between (X,X) is _____.

i) 0 ii) 1

iii) -1 iv) Var(X)

c) Equations of two regression lines are X+Y=8 and X-Y=4 then mean of X and Y are _____.

i) (2, 6) ii) (8, 4)

iii) (6, 2) iv) (0, 2)

P.T.O.

d) If $R_{1.23}=1$ then $R_{2.13}=$ _____.

i) 0 ii) -1

iii) 1 iv) none of these

e) If there exists perfect correlation between X and Y then r(X, Y) is _____.

i) 1 ii) 0

iii) -1 iv) -1 or +1

f) If r(X, Y) = -0.8 and $b_{yx} = -0.4$ then the value of b_{xy} is _____.

i) 1.6 ii) -1.6

iii) -0.4 iv) 0.4

g) When correlation coefficient r=0 then the two regression lines are _____.

i) parallel to each other

ii) perpendicular to each other

iii) Coincident

iv) none of these

h) If three regression planes coincide then determinant of total correlation coefficient matrix | R | or | Δ | is _____.

i) 0 ii) 1

iii) greater then zero iv) greater than 1

i) One can estimate value of Y for a given value of X by using _____.

i) line of regression X on Y

ii) line of regression Y on X

iii) graphical met

iv) none of these

j) The concept of rank correlation was given by _____.

i) Spearman

ii) Galton

iii) Mood

iv) none of these

Q2) Attempt any two of the following: **[20]**

a) What is correlation? Define Karl Pearson's correlation coefficient (r) and show that it lies between -1 to 1.

b) Derive the equation of regression line of Y on X by using least square method.

c) If $r_{12}=r_{13}=r_{23}=\rho$ then show that

i) $R^2_{1.23}=\frac{2\rho^2}{1+\rho}$

ii) $r_{12.3}=\frac{\rho}{1+\rho}$

Q3) Attempt any four of the following: **[20]**

a) State and prove effect of change of origin and scale on Karl Pearson's correlation coefficient.

b) Are the following values consistent?

$r_{12}=0.6$, $r_{13}=-0.4$, $r_{23}=0.7$.

c) If rank correlation coefficient (R) = 2/3 and $\Sigma d^2 = 55$. Find number of pairs in the series (n).

d) Explain r=0, r= –1 and r=+1 using scatter diagram.

e) Show that if $R_{1.23}= 0$ it does not imply that $R_{3.12}=0$.

f) Find coefficient of correlation between X and Y for following data.

n =7, Σx=119, Σx^2=2833, Σy=87, Σy^2=2385, Σxy=521.

EEE