S.Y.J.C.	*Maths Paper I & II*	*Assignment 1*

Q.1. Write converse and inverse of the following statement:

"If a man is a bachelor then he is unhappy."

Q. 2 Prove that the following statement pattern is a tautology:

$(q \rightarrow p) \vee (p \rightarrow q)$

Q. 3 Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 5 \\ 2 & 4 & 7 \end{bmatrix}$ by using adjoint method.

Q. 4 If P and q are true statements and r and s are false statements, find the truth value of the following:

$(p \wedge \sim r) \wedge (\sim q \wedge s)$

Q. 5 If A = $\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$, B = $\begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}$, find $(AB)^{-1}$

Q. 6 If the correlation coefficient between X and Y is 0.8, what is the correlation coefficient between

(a)   X and 3Y

(b)   X – 5 and Y – 3

Q. 7 If the sum of squares of differences of ranks for 10 pairs of observations is 66, find the rank correlation coefficient.

Q. 8 From the following table find q_0 :

x	0	1	2	3	4	5
l_x	1000	940	780	590	25	0

Q. 9 Compute CDR using the information given below:

Age group (years)	0 – 15	15 – 35	35 – 65	65 and above
Population	9000	25000	32000	9000

Q. 10 Two samples from bivariate populations have 15 observations each. The sample means of X and Y are 25 and 18 respectively. The corresponding sum of squares of deviations from means are 136 and 148. The sum of product of deviations from respective means is 122. Obtain the equation of line of regression of X and Y.

Q. 11 From the following table which relates to the number of animals of a certain species at age x, complete the life table:

x	0	1	2	3	4	5
l_x	1000	850	760	360	25	0

Q. 12 For 50 students of a class, the regression equation of marks in statistics (X) on the marks in accountancy (Y) is $3y - 5x + 180 = 0$. The mean marks in accountancy are 44 and the variance of marks in statistics is $\left(\frac{9}{16}\right) th$ of the variance of marks in accountancy. Find the mean marks in statistics and the correlation coefficient between marks in the two subjects.

Q. 13 The following data gives the marks of 20 students in mathematics (X) and statistics (Y) each out of 10, expressed as (x, y). Construct ungrouped frequency distribution considering single number as a class. Also prepare marginal distributions:

(2, 7)   (3, 8)   (4, 9)   (2, 8)   (2, 8)   (5, 6)   (5, 7)   (4, 9)

(3, 8)   (4, 8)   (2, 9)   (3, 8)   (4, 8)   (5, 6)   (4, 7)   (4, 7)

(4, 6)   (5, 6)   (5, 7)   (4, 6)

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