Q2

1.The mean life of a sample of 101 electric bulb produced by company is found to be 1570 hours with a S.D. of 120 hours. If $\mu$ is the mean life time of all the bulbs produced by the company, test the hypothesis $\mu = 1600$ hours against the Alternative Hypothesis $\mu \neq 1600$ hours, using a 5% level of significance

2. Solve the following LPP graphically

Minimize $z = 9 x1 + 10 x2$

Subject to constraints

$3x1 + x2 \geq 30$,

$X1 + 3x2 \geq 30$,

$X1 \geq 0, \quad X2 \geq 0$

3. Solve the following LPP graphically.

Maximize $z = 50x_1 + 100x_2$

Subject to constraints

$X_1 + 6x_2 \leq 30$,

$X_1 + x_2 \leq 12, \quad X_1, x_2 \geq 0$

4. In order to test whether the average weekly maintenance cost of a large number of private taxis belonging to a private company is atleast Rs.500 , random sample of 50 taxis was taken. The mean and the S.D. of the sample was found to be Rs. 497 and Rs.10.50 respectively. What will be the decision at 5% level of significance

5. Solve the following LPP graphically.

Minimise $Z = 50x_1 + 55 x_2$

Subject to constraints

$2x_1 + x_2 \geq 20, \quad x_1 + 3x_2 \geq 30, \quad x_1 \geq 0, \quad x_2 \geq 0$.

6. Solve the following LPP graphically

Maximize $z = 25X_1 + 10X_2$

Subject to constraints

$X_1 + 3X_2 \leq 12$,

$3X_1 + X_2 \leq 12, \quad X_1, X_2 \geq 0$

Q3 1.Find the inverse of the matrix $A = \begin{pmatrix} 2 & 1 & 2 \\ 1 & 2 & 0 \\ 3 & 1 & 1 \end{pmatrix}$

2. If A = $\begin{pmatrix} 6 & -3 \\ 4 & 8 \end{pmatrix}$ 　　　　B = $\begin{pmatrix} -3 & 6 \\ -8 & 4 \end{pmatrix}$

Find A x B – B x A and 3A + 5B

3. If p = $\begin{pmatrix} 2 & -1 \\ -4 & 3 \end{pmatrix}$ , find $p^2 - 3p + 2I$

4. Find the inverse of A = $\begin{pmatrix} 3 & 1 & 1 \\ -1 & 2 & 1 \\ 1 & 1 & 1 \end{pmatrix}$

5. If A = $\begin{pmatrix} 2 & 4 & 6 \\ 5 & 3 & 1 \end{pmatrix}$ and B = $\begin{pmatrix} 1 & 2 & 3 \\ 6 & 5 & 4 \end{pmatrix}$

Find i) 3A- 2B 　　ii) 5A + 3B

6. What is matrix and explain the types of matrices.

Q4  1. A,B and C started a business with a total capital Rs 3,00,000. At the end of the year, profits received by A,B and C were Rs 10,000 Rs. 25,000 and Rs 15,000 respectively. Find the amounts of capital invested by A,B and C.

2. In 4 days, 6 workers make 8 chairs. In 7 days, how many chairs will 9 workers make?

3. Ms.koirala made a 7% loss by selling the article for Rs.11,625.What would have been her percentage loss or gain had she sold it for Rs.13,250.

4. Ashok, Binita and Cedrik started a business investing capitals of Rs. 64,000, Rs. 48,000, and Rs. 80,000 respectively. At the end of the year, the profit was  Rs. 36,000, which was distributed among them in the proportion to their capitals. What was each partner's share of profit?

5. If 4 workers can make 3 tables in 6 days, how many days will 8 workers require to make 5 tables.

6.  A person earned 12% profit by selling an article at Rs.4,144.What would have been the selling price if he had sold it at 16% profit.

Q5.  1.  Find the correlation coefficient from the following information:

Returns of X = 17 　　　　　　Returns of Y = 12

Variance of X = 25 , Variance of Y = 9  ,  Covariance (x,y) = 9.5

Also find risk of portfolio where proportion of each security is 50%.

2. Calculate the expected return and the total risk of a share of a company whose probability distribution of returns is as follows:

| Return(%) | -6 | -3 | 0 | 4 | 8 | 12 | 16 |
|---|---|---|---|---|---|---|---|
| Probability | 0.05 | 0.1 | 0.2 | 0.3 | 0.2 | 0.1 | 0.05 |

3. Explain GDP, GNP, NDP and NNP

4. For two shares S1 and S2

Expected return (%) from S1 = 11.2

Expected return (%) from S2 = 10.4

Total risk from S1 = 1.36

Total risk from S2 = 5.44

Covariance of Return from S1 and S2 = 2.72

A portfolio has S1 and S2 in the proportion of 0.4 and 0.6 respectively. Find the expected return and the total risk of the portfolio.

5. Given below is the probability distribution of return of two stocks. Find the co-relation coefficient.

| Economic Conditions | Probability | Return of Stock A(%) | Return of Stock B (%) |
|---|---|---|---|
| A | 0.4 | 40 | 30 |
| B | 0.5 | 30 | 25 |
| C | 0.1 | -15 | -20 |

6. Explain Nominal GDP and real GDP.