Q.P. Code :05940

[Time: $2\frac{1}{2}$ Hours]   [Marks:75]

Please check whether you have got the right question paper.

N.B: 1.   All questions are compulsory Subject to internal choice
         2.   Figures to right indicate full marks.
         3.   Use of simple calculator allowed.

Q.1 A Choose the correct alternative (any 8)   08

i.   If the critical region is located in both the sides of sampling distribution of test statistic the test is.
       a)   One tailed
       b)   Two tailed
       c)   Right tailed
       d)   Left tail

ii.   If H_0 is true and we reject H_0 it is called
       a)   Type I error
       b)   Type II error
       c)   Standard error
       d)   Sampling error

iii.   Transpose of a row matrices is
       a)   Zero matrices
       b)   Diagonal matrices
       c)   Columns matrices
       d)   Row matrices

iv.   If determinant A = 0 then A is
       a)   Zero matrices
       b)   Singular matrices
       c)   Non singular matrices
       d)   Unit matrices

v.   A ratio equivalent to 3:7 is
       a)   3:9
       b)   6:14
       c)   9:14
       d)   1:7

vi.   The linear function Z which is to be minimized or maximized in a LPP is called
       a)   Decision variable
       b)   Objective function
       c)   Optimum function
       d)   Logical function

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vii. If a:b:c: =3:4:7 then the ration (a+b+c) : a is equal to
   a) 2:1
   b) 7:3
   c) 14:3
   d) 1:2

viii. The difference between the merchandise exports and imports is called
   a) Trade deficit
   b) Budgetary profit
   c) Fiscal deficit
   d) Fiscal profit

ix. In graphical solution the feasible solution is any solution is any solution to a LPP which satisfy.
   a) Only objective function
   b) Non negative restriction
   c) Only constraint
   d) All the three

x. Return is calculated as total gain divided by
   a) Selling price
   b) Purchase price
   c) Discounted price
   d) Return price

B State True or False (any 7)
   I. Determinant of a rectangular matrix can be found.   07
   II. NNP is GNP minus depreciation.
   III. Standard deviation is measure of risk.
   IV. Graphical method of linear programming is useful when the number of decision variables are three or more than three
   V. If there is no non negative replacement ratio in solving a LPP then the solution is unbounded.
   VI. The cost of surplus variable in simplex method is zero.
   VII. A is a matrix of order 2×3 then order of transpose of A is also 2×3.
   VIII. Risk is chance of getting less returns of an investment.
   IX. The duplicate ratio of 5:2 to 4:10.
   X. Matrix multiplication is commutative.

Q.2   A. Solve the following LPP by graphical method
       $Maximize\ Z = 2x_1 + 4x_2$ 08
       Subject to constraints
       $2x_1 + 3x_2 \leq 48$
       $x_1 + x_2 \leq 21$
       $x_1 \geq 0, x_2 \geq 0$

       B. A random sample of size 400 was drawn and the sample mean was found to be 339. Test whether   07
       this sample has come from a normal population with mean 342 and standard deviation 11.2 at 5%
       level of significance.

OR

p. solve the following LPP by simplex method   10

$$Maximize\ Z = 3x_1 + 4x_2$$

Subject to constraints

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

q. A company produces two products A and B. 1 unit of A requires 10 units of machine 1 and 6 units of ,05 machine2. 1 unit of product B requires 4 units of machine 1 and 8 units of machine 2. Capacities of machine 1 and machine 2 is 40 units and 48 units respectively. Profit per unit of A and B is Rs 10 and Rs 20 respectively. Formulate LPP.

Q.3   A.   Solve the following equation using the matrix inversion method   08

$$2x + 3y + z = 4$$
$$x + y + z = 1$$
$$4x + 9y + z = 6$$

B. A and B are partners in a business with the capitals Rs50000 and Rs20000 respectively. They admit C 07 in the business and give her $1/8^{th}$ share in the total profit. How much capital should C invest? Also find the proportion in which A, B and C will share the profit.

OR

p. There are two families A and B. There are 4 men, 6 women and 2 children in family A and 2 men   10 2 women 4 children in family B. The recommended daily allowance for calories in man is 2400, women is 1700 and child is 1600 and for protein is 56 gms for man, 45 gms for women and 33gms for child. Represent the above information by matrices. Using matrix multiplication calculate the total requirement of calories and protein for each of the two families.

q. 44% of the student of a class are girls. If the number of girls is 6 less than the number of boys,   05 how many students are there in the class?

Q.4   A.   A portfolio has share A and B, with the following distribution   15

State	Probabilities	Return of stock A%	Return of stock B%
Depression	0.1	13	20
Recovery	0.5	19	17
Prosperity	0.2	14	15
Recession	0.2	19	18

The proportion of share A is 60 % and share B is 40%. Calculate

I.   Expected returns of A
II.   Expected returns of B
III.   Calculate the risk of A
IV.   Calculate risk of B
V.   Covariance of returns from X and Y
VI.   Expected return from portfolio
VII.   Total risk from portfolio

OR

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p. From following information calculate Beta of a security and interpret the beta coefficient   08

Year	Return of security %	Return of Market portfolio %
1	12	14
2	15	17
3	18	16
4	15	14
5	15	18
6	20	17
7	18	20
8	12	10

q. Find the correlation coefficient from the following information   07

    Returns of X = 12   Returns of Y = 17
    Variance of X = 9   Variance of X = 25
    Covariance (x,y) = 9.5

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

Q.5   A. Write short notes (any three)   15
      I.   Duality in simplex method
      II.   Null and alternative hypothesis
      III. Systematic and unsystematic risk
      IV.   Nominal GDP and real GDP
      V.   Types of matrices

                                        OR

      p. What are the different methods of estimating GDP? Elaborate.   08
      q. Explain the concept of the decision criterion and critical region for   07
                  I.   A two tail test
                  II.   A one tail test