Shri S. H. Kelkar College of Arts, Commerce and Science, Devgad

F.Y.B.B.I SEMESTER-II Examination-April 2023

Course: Quantitative Methods-II

Maximum marks: 75 **Duration: 2 ½Hrs**

Instructions:

All questions are compulsory and carry equal marks

Figures to the right indicate full marks

Q.1 A) Choose the correct alternatives from the following. **08**

1. Level of significance of 5% means____

   a) 5% chance that we assumes wrong b) There are 5% chance to reject null hypothesis

   c) There are 5% chance to reject alternative hypothesis d) None of these

2. which of the following shows roght tailed test

   $a)\ H_1: u < 15$ $b)\ H_0: u < 15$ $c)\ H_1: u > 15$ $d)\ H_0: u < 15$

3. ____ are the restrictions or limitation imposed on the linear programming problem

   a) Cost b) variables c) profit d) constraints

4. _____ are the entries whose values are to be determined from the solution of linear programming

   a) Objective function b) constraints c) decision variables d) none of these

5. Value x and y if $\begin{bmatrix} x+3 & 1 \\ -3 & 3y-4 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ -3 & 2 \end{bmatrix}$

   $a)\ x = -1\ y = 2$ $b)\ x = 1\ y = -2$ $c)\ x = -2\ y = 2$ $d)\ x = 1\ y = 2$

6. Determinant of $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 5 & 1 \\ 0 & 0 & 4 \end{bmatrix}$

   a) 18 b) 20 c) 25 d) 5

7. the matrix of order 1×n is called_____ matrix

   a) row b) column c) unit d) scalar

8. Two numbers are in the ratio 2:3. If 5 is added to each number, the ratio becomes 5:7 Find the numbers__

   $a)\ 20, 10$ $b)\ 10, 30$ $c)\ 20, 30$ $d)\ 10, 10$

9. Third proporational to 8 and 16 is____

   a) 30 b) 20 c) 8 d) 32

10. Saurabh obtains 18 marks in a test of 25 marks, the percentage of marks ___

    $a)20\%$ $b)70\%$ $c)60\%$ $d)72\%$

B) State whether the following statements are true or false (Any 7) **07**

1. The probability of committing Type-I error is called level of significance
2. If the computed value falls outside the rejection region, then the null hypothesis is rejected
3. Type-1 error is when we reject the null hypothesis when it is actually true
4. Feasible solution is a set of values which satisfies only objective function
5. Optimal solution to any linear programming problem will lie at centre of feasible region
6. All linear programms must formulate to maximize some quantity
7. A scalar matrix is diagonal matrix
8. Matrix addition is commutative
9. If A:B=2:3 and B:C then A:C=8:15
10. Ratio has no unit

Q.2 A) The standard pain reliever is known to bring relief on an average of 3.5 minutes with standard deviation of 1.5 minutes. A new pain reliever is invented and applied to 50 patients. The experiment result sample mean=3.1 minutes, is there sufficient evidence which indicates new pain reliever deliver relief more quickly? Take $\alpha = 0.05, -Z_\alpha = -1.645$ **08**

OR

Explain Null and Alternative hypothesis

07

Q.2 B) A factory manufactures two products A and B.To produce 1 unit of A requires 40 machine hour and 40 labour hours. 1 unit of B requires 20 machine hours and 160 labour hours. Profit per unit of product A and B is RS.10 and RS.15 respectively. The maximum availability of machine and labour hour is 800 and 1600 respectively. Formulate the LPP

OR

Solve the given LPP graphically , Maximize $Z = 100x + 80y$ $subject\ to\ constraints$ $6x + 4y \leq 7200; 2x + 4y \leq 4000, x, y \geq 0$

Q.3 A) Find the adjoint of A= $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & -3 \\ -1 & 2 & 3 \end{bmatrix}$ **08**

OR

Using Cramer's rule solve the following system of equation $2y - z = 0; x + 3y = -4; 3x + 4y = 3$

Q.3 B) Solve the following : **07**

a) Divide 1875 into three parts in the ratio 4:5:6
b) The sum of three numbers is 98. If the ratio of first to second is 2:3 and of the second to third is 5:8, then find second number
c) A shopkeeper buys an article for RS.360 and sells it for RS.270.Find his gain or loss percent

OR

A man sold two horses for RS.29,700 each. On each he lost 10% while he gained 10% on the other. Find his total gain or loss percent in the transaction.

Q.4 Attempt any three **15**

a) Define Expected return. Calculate expected return and risk of the portfolio with propoartion 0.6 and 0.4 for X and Y. Given COV(1, 2)=5

Security	Expected return	Standard deviation
1	10	3
2	20	6

b) Explain the different measures of risk

c) Find the correlation coefficient from the following

$\overline{R_x} = 12\ \overline{R_y} = 14\ \sigma_x = 3, \sigma_y = 4\ \ COV(x,y) = +9.5$ Also find the risk of portfolio where proporation of each security is 50%

d) Explain the concept of Return

Q.5 Attempt any three **15**

a) Define 1) GNP 2) NDP 3) PCI 4) National income

b) Explain the indices of agriculture production and industrial production

c) What are economic infrastructure? Explain it briefly.

d) Explain GDP deflator