

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

12.3.20

[Marks:75]

NOTE: i) All questions are compulsory.**ii) In Q.1 , attempt both the sub-parts A and B.****iii) Figures to the right indicate marks.****iv) Use of non-programmable calculator is allowed.****Q 1) A.Fill in the blanks with correct alternative. (Attempt any Eight) [8]**

- The hypothesis rejecting the null hypothesis is called as _____ hypothesis.
(null, alternate, positive)
- If $H_0: \mu \geq \mu_0$ is the full hypothesis, then the test is _____.
(two tailed, left tailed, non tailed)
- The linear function z which is to be minimized or maximized in a L.P.P. is called as _____.
(subjective, objective, decisive, optimum)
- Linear programming forms the basic foundation for an important branch of mathematics and statistics, called as _____.
(Linear Research, Operations Research, None)
- A square matrix whose all diagonal values are 1 and remaining are zero is called as _____ matrix.
(singular, non-singular, identity, singleton)
- Determinant of non-singular matrix is _____ matrices.
(negative , non-zero, zero, does not exist)
- If 15% of certain amount is Rs. 300, then amount is Rs. _____.
(2250, 2000, 1520,4500)
- The inverse ratio of 5:2 is _____.
(25:4, 2:5, 125:8, none of these)
- _____ risk is undiversifiable and the investors cannot avoid it..
(systematic, unsystematic, business, liquidity)
- The difference between the merchandise exports and imports is called as _____.
(trade deficit, trade profit, trade revenue, trade balance)

Q 1) B. State whether the following statements are True or False. (Attempt any seven) [7]

- In left tailed test, if $Z > 1.28$ using 10% LOS then null hypothesis is accepted.
- S.E. stands for standard estimate.
- An objective function is one of the component of LPP.
- The feasible region in LPP gives the solution of LPP.
- Inverse is possible only for singular matrix.
- Matrix addition is commutative.
- Sub-Duplicate ratio is one of the type of compound ratio.
- Percentage of $1/8$ is 37.5%.
- The coefficient of correlation always lies between 0 and 1.
- NDP = GNP – Depreciation.

Q.2. Solve following:

- A. Is it likely that a sample of size 450 whose mean is 25, is a random sample from a large population with mean 21.6 and s.d. 7.4? Use 1% level of significance. [7]
- B. Solve the following LPP graphically: [8]
Maximize: $50x + 30y$, subject to : $5x + 3y \leq 45$, $2x + 7y \leq 56$, $x \geq 0$, $y \geq 0$

OR

- C. Solve the following LPP by simplex method:
Maximize: $Z = 500x + 250y$,
Subject to: $x + y \leq 26$, $7x + 3y \leq 84$, $x, y \geq 0$ [8]
- D. A die is thrown 5000 times and a throw of 1 or 2 is observed 1240 times. If getting 1 or 2 is considered as success test whether the die is unbiased or not? Use 5% level of significance. [7]

Q.3. Solve the following:

- A. Solve the following LPP graphically:
Minimise $z = 6x + 4y$
Subject to : $x + y \geq 6$, $5x + y \geq 15$, $7x + 2y \geq 28$, $x, y \geq 0$
- B. Find matrix X such that $5X + 7A - 8B = 0$ where

$$A = \begin{bmatrix} 4 & 1 & -2 \\ 3 & -2 & 5 \\ 7 & -1 & 1 \end{bmatrix} \text{ And } B = \begin{bmatrix} -2 & 3 & -1 \\ 1 & 7 & -3 \\ 5 & 8 & 9 \end{bmatrix} \quad [7]$$

OR

- C. Find inverse of matrix $A = \begin{bmatrix} 6 & 5 & 2 \\ 2 & -2 & 1 \\ 3 & 2 & 1 \end{bmatrix}$ by using adjoint method. [8]
- D. A and B are partners in a business with capitals Rs.4,50,000 and Rs.3,60,000 respectively. They admit C in business, giving him $1/13^{\text{th}}$ share of the total profit. How much capital should C invest? What is the proportion in which A,B and C will share the profit? [7]

Q.4. Solve the following:

- A. Solve the following equations simultaneously using matrix inversion method:
 $2x + y - 3z = 5$, $x - 2y + z = 8$, $3x + y - z = 10$. [8]
- B. By selling an article at Rs. 4200, a person lost 20% profit. At what price should he have sold it to gain 16%? [7]

OR

- C. From the following information calculate expected return of both the company and compare: [8]

State of economy	Probability of occurrence		Expected rate of return	
	A ltd.	B ltd.	A ltd.	B ltd.
Recession	0.3	0.5	6	7
Normal	0.3	0.3	12	12
Boom	0.4	0.2	20	24

- D. The ages of father and son are in the ratio 11:5. The ratio of their ages after 15 years will be 7:4. Find the ratio of their ages 5 years back.

Q.5.

- A. Explain in brief GDP and GNP. [8]
 B. Explain the different measures of money supply, giving their formulae. [7]

OR

- C. **Short notes: (any 3)**
- a. Hypothesis
 - b. Square matrix and its types
 - c. Proportion and its types
 - d. Adjoint Method
 - e. Debt service ratio

Wish You All The Best

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