MALINI KISHOR SANGHVI COLLEGE OF COMMERCE & ECONOMICS
SUBJECT: Quantitative Methods-II

CLASS: F.Y.B.Com.(B&I)	SEM-II ATKT	SEAT NO. _____

Name:

Note:
    (i) All Questions are compulsory with internal choice.
    (ii) Simple Calculator is allowed.
    (iii) Graph papers will be provided on request.

Q1. Attempt any 15 QUESTIONS from given 20 and write your **correct option number** in answer book. **[15]**

Q.NO.	Question	Option 1	Option 2	Option 3	Option 4
1	The mean time a health insurance company takes to pay claims is less than 14 working days. The alternative hypothesis is:	H1: Population mean time =14	H1: Population mean time >14	H1: Population mean time <14	H1: Population mean time ≠ 14
2	The mean time a health insurance company takes to pay claims is less than 14 working days. The null hypothesis is:	Cannot be defined	H0: Population mean time ≤ 14	H0: Population mean time ≥14	H0: Population mean time ≠ 14
3	A Type II error is committed when	we reject a null hypothesis that is true.	we don't reject a null hypothesis that is true.	we reject a null hypothesis that is false.	we don't reject a null hypothesis that is false.
4	A Type I error is committed when	we reject a null hypothesis that is true.	we don't reject a null hypothesis that is true.	we reject a null hypothesis that is false.	we don't reject a null hypothesis that is false.
5	Hypothesis H_0: $\mu = 14$ against H_1: $\mu < 14$. The problem is	Right tailed.	Left tailed.	Two-tailed.	Data is insufficient
6	Hypothesis H_0: $\mu = 375$ against H_1: $\mu \neq 375$. The problem is	Right tailed.	Left tailed.	Two-tailed.	Data is insufficient
7	A Linear Programming Problem is aimed at optimization (max. or min.) of _____	variables	constraints	function of degrees 2 and above	objective functions
8	For the linear equation x+4y = 12, the point at which it intersect x-axis on graph is _____	(0,0)	(0,3)	(12,0)	(12,3)
9	For the linear equation 2x+ 2y = 18, the point at which it intersect y-axis on graph is _____	(9,9)	(0,0)	(0,9)	(9,0)
10	L.P.P. is:	Linear Programming Problem	Limit Procedure Program	Logarithmic Programming Problem	Linear problem Programming
11	The conditions imposed on the variable in L.P.P. are known as	objective function	constraints	Linear variable	Limit variable

12	A linear programming problem optimizes the	objective function	constraints	Linear variable	Limit variable
13	A point satisfying the constraint is known as...............	Solution	Feasible solution	Optimal solution	Not a solution
14	A point satisfying the constraint and non-negative condition is known as...............	Solution	Feasible solution	Optimal solution	Not a solution
15	A point optimizing the objective function and satisfying the constraint and non-negative condition is known as...............	Solution	Feasible solution	Optimal solution	Not a solution
16	A matrix of order 1 X n is known as:	Row matrix	Column matrix	Square matrix	Diagonal Matrix
17	A matrix of order n X 1 is known as:	Row matrix	Column matrix	Square matrix	Diagonal Matrix
18	A matrix of order n X n is known as:	Row matrix	Column matrix	Square matrix	Diagonal Matrix
19	If A is m X n matrix and B is o X p matrix. Then AB can be calculated if	m=n	n=o	m=p	o=p
20	Cash discount is usually calculated as a percentage on the _____ .	Cost Price	Net selling price	Invoice price	List price

Q:2   Solve the following : (ANY-ONE)   15 Marks

[A]

i.   Explain the difference between Type I and Type II error.

ii. The quality-control manager at a light bulb factory needs to determine whether the mean life of a large shipment of light bulbs is equal to 375 hours. The population standard deviation is 100 hours. A random sample of 64 light bulbs indicates a sample mean of 350 hours. At the 0.05 level of significance, is there evidence that the mean life is different from 375 hours?
Formulate the null and alternative hypothesis.
Define your rejection rule. Show the rejection region in a diagram.
Can null hypothesis be rejected? What is your conclusion?

OR

[B]

i.   Explain the difference between Null hypothesis and Alternative hypothesisi.

ii. Starting annual salaries for individual with master's and bachelor's degree in business were collected in two independent random samples. Use the following data to carry out 5% significance tests for the difference in the salary.

	Master's Degree	Bachelor's Degree
Sample size	60	80
Sample mean	45000	35000
Population Standard deviation	4000	3500

Q:3   Solve the following: (ANYONE)   10 Marks

[A]

i. A manufacturer produces two products A and B. He has his machines in operation for 24 hours a day. Production of each unit of A requires 2 hours of processing in machine M_1 and 6 hours in machine M_2. Production of each unit of B requires 6 hours of processing in machine M_1 and 2 hours in machine M_2. The manufacturer earns a profit of Rs. 50 on each unit of A and Rs. 20 on each unit of B. Formulate the LPP.

ii. Solve the following LPP.

$$Minimize, Z = x + 1.5y$$
$$Subjected\ to\ 20x + 20y \geq 160,\ 20x + 60y \geq 300\ and\ x, y \geq 0$$

OR

[B]

i. Daily requirement of two vitamins V_1, V_2 and the mineral M for a certain person is at least 10 units of V_1, 12 units of V_2 and 20 units of M. He meets this requirement by consuming tablets with brand names X and Y. A tablet X has 4 units of V_1, 3 units of V_2 and no M. A tablet Y has 1 units of V_1, 2 units of V_2 and 4 units of M. Cost of a tablet X is 40 paise and that of a tablet Y is 60 paise. Formulate the LPP.

ii. Solve the following LPP.

$$Maximize, Z = 90x + 130y$$
$$Subjected\ to\ 2x + 3y \leq 18,\ 2x + y \leq 12\ and\ x, y \geq 0$$

Q:4 Solve the following: (ANY-ONE)   **10 Marks**

[A]

i. Given the following matrices:

$A = \begin{pmatrix} 2 & 4 \\ 8 & 3 \end{pmatrix} B = \begin{pmatrix} -1 & 2 \\ 7 & 7 \end{pmatrix}$ calculate AB and BA. Verify whether AB=BA?

ii. Solve the following system of equations by finding the inverse of associated matrix A.

$2x + 3y = 8, 3x + 2y = 7$ $A = \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix}$

OR

[B]

i. Given the following matrices:

$A = \begin{pmatrix} 2 & 4 \\ 8 & 3 \end{pmatrix} B = \begin{pmatrix} -1 & 2 \\ 7 & 7 \end{pmatrix}$ calculate $2A + 3B$.

ii. Find the invers of the following matrix. $A = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 4 \\ 1 & 3 & 4 \end{pmatrix}$

Q:5 Solve the following: (ANY-ONE)   **10 Marks**

[A]

i. Divide a profit of Rs.25,828 between 2 partners in the ratio 4.7

ii. By selling an article at Rs.3,000, a person earned 20% profit. What would have been the percentage profit or loss, if he had sold it at Rs.2,750?

OR

[B]

i. If 40% of a number is equal to 2/3rd of another number, what is the ratio of 1st number to the 2nd number?

ii. If A takes 5 days to complete a task when he works for 8 hrs a day, how many days he will take to complete the task if he works 5 hrs a day?