17912

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – BBA LL.B.-2021/BBA LL.B.-2022/BBA LL.B.-2023/BBA LL.B.-2024
Course Name – Quantitative Analysis
Course Code - BBALLB301
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Locate "A physical model is an example of"

a) Iconic model
b) analogue model
c) verbal model
d) symbolic model

(ii) Select which one is not correct.

a) a model should be simple and coherent
b) a model should not take much time in its construction for any problem
c) A model representing the typical budget of business accounts is called "account model"
d) a model which has the probability of measuring observations is called "qualitative model"

(iii) Select the wrong one.

a) Models are only an attempt in understanding operations and should never be considered as absolute in any case.
b) Iconic models are pictorial representation of real system
c) Heuristic model are particular cases of Iconic models
d) Analogue models are most abstract than iconic ones.

(iv) Non-negativity condition is an important component of LPP, because----------Select the correct option.

a) variables are inter-related in terms of limited resources
b) value of variables make sense and correspond to real world problems
c) value of variables should remain under the control of decision-maker
d) none of these

(v) Define "The general linear programming problem is in standard form", if

a) the constraints are strict equations
b) the constraints are inequalities of 'less than or equal to' type

c) the constraints are inequalities of 'greater than or equal to'type

d) the decision variables are unrestricted in sign

(vi) In a fair game, examine the value of the game.

a) Positive

b) 0

c) Negative

d) Can't say anything

(vii) In game theory, a choice that is optimal for a firm no matter what its competitors do is predicted as

a) the dominant strategy.

b) the game-winning choice.

c) super optimal.

d) super optimal.

(viii) Game theory is established as

a) predicting the results of bets placed on games like roulette.

b) the choice of an optimal strategy in conflict situations.

c) utility maximization by firms in perfectly competitive markets.

d) the migration patterns of caribou in Alaska.

(ix) Considering the following two-person game, calculate the value of the game (if played many times).

	Y_1	Y_2
X_1	6	3
X_2	2	8

a) 19.00

b) 4.75

c) 11.00

d) none of these

(x) Considering the following two-person game, choose X's best strategy.

	Y_1	Y_2
X_1	3	6
X_2	2	-2

a) X_1

b) X_2

c) Y_1

d) Y_2

(xi) Select the correct option. The North-West Corner Rule is used for:

a) Testing optimality

b) Finding an initial basic feasible solution

c) Maximizing profits

d) Drawing network diagrams

(xii) Select the correct option. The Hungarian Method is used to solve:

a) Transportation Problems

b) Assignment Problems

c) Linear Equations

d) Game Theory Problems

(xiii) Select the correct option. In an Assignment Problem, the number of rows and columns must be:

a) Unequal

b) Equal

c) At least 3

d) At least 5

(xiv) Select the correct option. The objective of an Assignment Problem is to:

a) Maximize profits

b) Minimize cost or time

c) Balance transportation

d) Find shortest paths

(xv) Identify the method from the following that is a method for solving LPP algebraically.

a) Graphical method

b) MODI method

c) Simplex method

d) Hungarian method

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Identify all the basic solutions of the following equations. (3)

$3x_1 + x_2 - x_3 = 3$

$2x_1 + 3x_2 + x_3 = 2$

3. A manufacturer has two types of machines to choose from. He must have at least three A type of machine and one B type of machine. The cost of the machine is Rs. 1000 and Rs. 1200 for the type A and B respectively. The floor area taken by the two types of machines are $4m^2$ and $5m^2$ respectively. The total cost must not exceed Rs. 15000 and the total available floor space is $40m^2$ Illustrate a LP problem to minimize the cost. (3)

4. Indicate the initial B.F.S of the Transportation problem by Matrix Minima method also find the cost. (3)

	D1	D2	D3	D4	Availability
O1	3	5	7	6	50
O2	2	5	8	2	75
O3	3	6	9	2	25
Demand	20	20	50	60	

5. Write the Minimax and Maximin principle. (3)

6. Evaluate the dual of the given problems (3)

Max $Z = 2x_1 + 3x_2 + x_3$

Subject to

$4x_1 + 3x_2 + x_3 = 6$

$x_1 + 2x_2 + 5x_3 = 4$

$x_1, x_2 \geq 0$

OR

Evaluate the following L.P model in the standard form (3)

Max. $Z = 3X_1 + X_2 + 2X_3$

Subject to

$2X_1 - 3X_2 \leq 7$

$4X_1 + X_2 + 2X_3 \geq 3$

$X_1 + 3X_3 \leq 5$

$X_1 \geq 0, X_2 \geq 0.$

Group-C

(Long Answer Type Questions) 5 x 6=30

7. A factory engaged in manufacturing two products A and B which involve lathe work, grinding and assembling. The cutting, grinding and assembling times required for one unit of A are 2, 1 and 1 hours respectively and those for one unit of B are 3,1 and 3 hours respectively. The profit on each unit of A and B are Rs. 2.00 and Rs.3.00 respectively. Assuming that 300 hours of lathe time, 300 hours of grinding time and 240 hours of assembling time are available, Describe this as an LPP in terms of maximizing the profit on the times manufactured. (5)

8. Evaluate the solution of the following pay-off matrix: (5)

Player A	Player B			
	Strategies	I	II	III
	I	6	8	6
	II	4	12	2

9. Write the definition of strategy, pure strategy, mixed strategy. (5)

10. Consider the following assignment problem, estimate the solution of it. (5)

	1	2	3	4	5
A	6	5	8	11	16
B	1	13	16	1	10
C	16	11	8	8	8
D	9	14	12	10	16
E	10	13	11	8	16

11. Illustrate the utility of using Graphical method in LPP. (5)

12. One kind of cake requires 200 g of flour and 25g of fat, and another kind of cake requires 100 g of flour and 50 g of fat. Evaluate the maximum number of cakes that can be made from 5 kg of flour and 1 kg of fat assuming that there is no shortage of the other ingredients, used in making the cakes. (5)

OR

Evaluate the solution of the given linear programming problems graphically: (5)

Maximize: $Z = 50x + 15y$

Constraints are,

$5x + y \leq 100$

$x + y \leq 50$

$x \geq 0, y \geq 0.$

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