BRAINWARE UNIVERSITY

Term End Examination 2022
Programme – BBA-2018/BBA-2019/BBA-2020
Course Name – Quantitative Techniques for Management/Quantitative Techniques in Management
Course Code - BBA501/BBAC501
(Semester V)

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)   Dual of the dual is described as

   a) Primal   b) Dual
   c) Any one may be   d) None

(ii)   Operation research approach is identied as

   a) Multi-disciplinary   b) Artificial
   c) Intuitive   d) All of these

(iii) Mathematical model of Linear Programming is important because it helps to examine

   a) the verbal description and numerical data into   b) formal models preferred by experts
      mathematical expression
   c) relevant relationship among decision factors.   d) use of algebraic techniques

(iv)   The Hungarian method for solving an assignment problem can also be used to solve_____. Select the right option.

   a) A transportation problem   b) A travelling salesman problem
   c) A LP problem   d) Both a transportation problem & a travelling salesman
                                                                     problem

(v)   In a transportation problem, we must make the number of _____ and _____ equal. Select the right option.

   a) destinations; sources   b) units supplied; units demanded
   c) positive cost coefficients; negative cost coefficients   d) warehouses; suppliers

(vi)   In a maximization assignment problem, the cost matrix is rewrote as

   a) Opportunity loss matrix   b) Cost-Pay off matrix
   c) Value maximization matrix   d) Both Opportunity loss matrix and Value maximization
                                                                     matrix

(vii) Which of the following statements about the northwest corner rule is not applied?

   a) One must exhaust the supply for each row before moving   b) One must exhaust the demand requirements of each
      down to the next row   column before moving to the next column
   c) When moving to a new row or column, one must select the   d) One must check that all supply and demand constraints are
      cell with the lowest cost.   met.

(viii) A feasible solution of a transportation problem is determined when

   a) all of the improvement indexes are positive   b) the number of filled cells is one less than the number of
                                                                     rows plus the number of columns
   c) the solution yields the lowest possible cost   d) all demand and supply constraints are satisfied

(ix)   The total cost of the optimal solution to a transportation problem

   a) is calculated by multiplying the total supply (including any   b) cannot be calculated from the information given
      dummy values) by the average cost of the cells
   c) is found by multiplying the amounts in each cell by the cost   d) can be calculated based only on the entries in the filled cells
      for that cell for each row and then subtract the products of   of the solution
      the amounts in each cell times the cost of each cell for the
      columns

(x)   Zero-sum game can be considered if,

   a) what one player wins, the other loses.   b) the sum of each player's winnings if the game is played
                                                                     many times must be zero.
   c) the game is fair—each person has an equal chance of   d) long-run profits must be zero.
      winning.

(xi)   PERT stands for: select for the options

   a) Positive Error Reporting Time   b) Programme Evaluation Review Technique
   c) Programme Evaluation and Research Theory   d) Process Evaluation and Research Technique

(xii) A game can be formally defined as a kind of search problem with the following components.Infer

   a) Initial State   b) Successor Function
   c) Terminal Test   d) All of the mentioned

(xiii) Judge that Two person zero-sum game means that the

   a) Sum of losses to one player is equal to the sum of gains to   b) Sum of losses to one player is not equal to the sum of gains

other   to other

c) Both Sum of losses to one player is equal to the sum of gains   d)
to other and Sum of losses to one player is not equal to the   None of these
sum of gains to other

(xiv) Select from the follwing: The maximin criteria is a(n) _____ criteria.

   a) optimistic   b) neutral
   c) pessimistic   d) can be any one of the above depending on the problem

(xv) Suppose that player A is able to move first, followed by player B. Write the outcome in this case:

   a) Player A and B will both play strategy 1.   b) Player A will play strategy 1 while player B plays strategy 2.
   c) Player A will play strategy 2 while player B plays strategy 1.   d) Both players will play strategy 2

Group-B
(Short Answer Type Questions)   3 x 5=15

2.   (3)

Determine the feasible solution of the following transportation problem using North West Corner Method:

	W1	W2	W3	W4	Supply
F1	14	25	45	5	6
F2	16	25	35	55	8
F3	35	3	65	15	16
Demand	4	7	6	13	

3. Solve the following LP problem using graphical method.   (3)

Maximize $Z = 2X_1 + X_2$

s.t. the constraints

a) $X_1 + 2X_2 \leq 10$

b) $X_1 + X_2 \leq 6$

c) $X_1 - X_2 \leq 2$

d) $X_1 - 2X_2 \leq 1$

$X_1, X_2 \geq 0$

4. A chemist requires 10, 12 and 12 units of chemicals X, Y, Z respectively for his garden. A liquid product contains 5, 2 and 1 units of X, Y and Z respectively. A dry product contains 1, 2 and 4 units of X, Y and Z per carton. If the liquid product sells for Rs. 30 per jar and the dry product sells for Rs. 20 per carton, how many of each should be purchased in order to minimize the cost and meet the requirements? Illustrate the problem.   (3)

5. Explain the two-person zero sum game, giving a suitable example.   (3)

6. Express the difference between transportation and assignment problem.   (3)
OR
Express the types of problems in decision making under different environment.   (3)

Group-C
(Long Answer Type Questions)   5 x 6=30

7. State the difference between feasible solution and basic feasible solution.   (5)

8. 'PERT takes care of uncertain durations.' Justify the statement.   (5)

9.   (5)

Identify the dual of the following problem:

Minimize $Z = X_1 + 2X_2$

Subject to constraints:

$$2X_1 + 4X_2 \leq 160$$

$$X_1 - X_2 = 30$$

$$X_1 \geq 10$$

$$X_1, X_2 \geq 0$$

10. In a game of matching coins, player A wins Rs 8, if both coins show heads and Rs. 1 if both are tails. Player B wins Rs. 3 when coins do not match. Given the choice of being player A or player B, determine the strategy of the players? (5)

11. Estimate the dual of the following primal problem. (5)

Minimize $Z = X_1 - 3X_2 - 2X_3$

s.t.

a) $3X_1 - X_2 + 2X_3 \leq 7$

b) $2X_1 - 4X_2 \geq 12$

c) $-4X_1 + 3X_2 + 8X_3 = 10$

$X_1, X_2 \geq 0$, X_3 unrestricted in sign.

12. Distinguish between maximin and minimax strategy. (5)

OR

(5)

A small project involves 7 activities, and their time estimates are listed in the following table. Activities are identified by their beginning (i) and ending (j) node numbers.

Activities	Optimistic	Most Likely	Pessimistic
1 – 2	1	1	7
1 – 3	1	4	7
1 – 4	2	2	8
2 – 5	1	1	1
3 – 5	2	5	14
4 – 6	2	5	8
5 – 6	3	6	15

Evaluate the critical path.

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