BRAINWARE UNIVERSITY

Term End Examination 2023
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) The graphical method of Linear Programming Problem can be examined if there are only
   a) 3 variables   b) 2 variables
   c) Infinite number of variables   d) None

(ii) Operation research analysis does not describe
   a) Predict future operation   b) Build more than one model
   c) Collect the relevant data   d) Recommended decision and accept

(iii) A feasible solution of LPP observes that it
   a) must satisfy all the constraints simultaneously   b) need not satisfy all the constraints, only some of them
   c) must be a corner point of the feasible region   d) must provide optimal solution.

(iv) In a transportation problem, when the number of occupied routes is less than the number of rows plus the number of columns -1, then the solution is expressed as
   a) Unbalanced   b) Feasible
   c) optimal   d) degenerate

(v) The northwest corner rule ask that we start allocating units to shipping routes in the:
   a) Middle cell   b) Lower right corner of the table
   c) upper left hand corner of the table   d) upper right corner of the table

(vi) In Vogel's Approximation Method, the opportunity cost associated with a row is represented by
   a) The difference between the smallest cost and the next smallest cost in the row   b) The difference between the smallest unused cost and the next smallest unused cost in the row
   c) The difference between the smallest cost and next smallest unused cost in the row   d) None of these

(vii) The application of the transportation approach for locational analysis is to minimize
   a) total costs   b) total shipping costs
   c) total variable costs   d) total fixed costs

(viii) When the number of shipments in a feasible solution is less than the number of rows plus the number of columns minus one, it explains
   a) the solution is optimal   b) there is degeneracy, and an artificial allocation must be created
   c) a dummy source must be created   d) a dummy destination must be created

(ix) To make an unbalanced assignment problem balanced_____ are administered.
   a) Dummy rows   b) Dummy columns
   c) Both Dummy rows and Dummy columns   d) Dummy entries

(x) Decide that, in a mixed strategy, each player should optimize the
   a) maximum payoffs   b) minimum loss
   c) maximum loss.   d) expected gain.

(xi) A game can be formally composed as a kind of search problem with the following components.
   a) Initial State   b) Successor Function
   c) Terminal Test   d) All of the mentioned

(xii) Test that a dummy activity is required when
   a) Two or more activities have the same starting events   b) Two or more activities have different ending events
   c) Two or more activities have the same ending events   d) The network contains two or more activities that have identical starting and ending events

(xiii) Zero sum game has to be a _____ game. Anticipate.
   a) Single player   b) Two player
   c) Three player   d) Multiplayer

(xiv) What is the term for the 'rule of thumb' type of bias in decision making? Select from the following:
   a) Framing bias   b) Hindsight bias
   c) Over-confidence bias   d) Heuristics

(xv) A basic feasible solution is called ------ if the value of at least one basic variable is zero. Choose from the following

Group-B
(Short Answer Type Questions)

3 x 5=15

2. A company sells two different products A and B, making a profit of Rs. 40 and Rs. 30 per unit, respectively. They are both (3) produced with the help of a common production process and are sold in two different markets. The production process has a total capacity of 30, 000 man hours. It takes three hours to produce a unit of A and one hour to produce a unit of B. The market has been surveyed and company officials feel that the maximum number of units of A that can be sold is 8000 units and that of B is 12,000 units. Subject to these limitations, the product can be sold in any combination. Illustrate this problem as an LP model to maximize profit.

3. Explain fundamental principle of duality. (3)

4. Compare pure strategy and mixed strategy. (3)

5. Explain the purpose of using slack, surplus and artificial variables in LP problem. (3)

6. Assess the three-time estimates under PERT. (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. (5)

Deduce an initial feasible solution to the following transportation problem by using least cost method.

	D1	D2	D3	D4	Supply
S1	21	16	15	3	30
S2	17	18	14	23	13
S3	32	27	18	41	19
Demand	6	6	8	23	

8. (5)

Five men are available to do five different jobs. From past records, the time (in hours) that each man takes to do each job is known and is given in the following table:

Men		Jobs				
		I	II	III	IV	V
	A	2	9	2	7	1
	B	6	8	7	6	1
	C	4	6	5	3	1
	D	4	2	7	3	1
	E	5	3	9	5	1

9. What are slack, surplus and artificial variables and explain the purpose of them. (5)

10. Identify the key element from the 1st table of simplex problem given below: (5)

Max $Z = 3X1 + 5X2 + 4X3$

s.t.

a) $2X1 + 3X2 \leq 8$

b) $2X2 + 5X3 \leq 10$

c) $3X1 + 2X2 + 4X3 \leq 15$

$X1, X2, X3 \geq 0$

11. Explain pure strategy and mixed strategy. (5)

12. Express the fundamental principles of linear progeamming problem. (5)

OR

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

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