MB–202

M. B. A. (SECOND SEMESTER)
MID SEMESTER
EXAMINATION, 2021-22
QUANTITATIVE TECHNIQUES

Time : 1½ Hours

Maximum Marks : 50

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False :

(1×10=10 Marks)

(a) .... method is used in assignment problem.

(b) Least cost method gives best initial solution. (True/False)

(c) Modi method can be applied only if number of allocations are equal to $m + n - 1$.   (True/False)

(d) Graphical method in LP can be used for only two variables.   (True/False)

(e) When a constraint does not become part of the boundary making feasible region, it is called ....

(f) Unbounded solution occurs in minimization type problem.   (True/False)

(g) The basic solution which also satisfies non-negativity condition is called ....

(h) When the supply is less than the demand in transportation, then we add a row in the table.   (True/False)

(i) Tie in the choice of entering variable is called degeneracy in LP.   (True/False)

(j) Phillip M. Morse is known as father of Operations Research.   (True/False)

Section—B

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each question contains three parts (a), (b) and (c). Attempt any one part of choice (a) and (b) from each question and part (a) is compulsory of each question.

2. (a) Write down in brief about history, scope, application and limitation of operations research.   10 Marks (CO1)

OR

(b) Solve the problem by graphical method :   10 Marks (CO1)

Min. :
$$z = 6x_1 + 4x_2$$

Subject to the constraints :
$$3x_1 + 3x_2 \geq 40$$
$$3x_1 + x_2 \geq 40$$
$$2x_1 + 5x_2 \geq 44$$

(c) Find how many units of products A and B should be made per week by simplex method. Product A requires 2 kg of raw material 4 hours of labour work while B requires 3 kg of raw material and 3 hours of labour work. The availability of raw material is 60 kg and 96 hours of labour work per week. Profit per unit on products A and B is ₹ 40 and ₹ 35 respectively.

10 Marks (CO1)

OR

3. (a) Find out maximum profit possible through optimal assignment : 10 Marks (CO2)

	M1	M2	M3	M4	M5
J1	30	37	40	28	40
J2	40	24	27	21	36
J3	40	32	33	30	35
J4	25	38	40	36	36
J5	29	62	41	34	39

OR

(b) Find out initial solution by Vogel's approximation method : 10 Marks (CO2)

Destination

		D_1	D_2	D_3	D_4	Availability
	O_1	1	2	1	4	20
Origin	O_2	3	3	2	1	40
	O_3	4	2	5	9	20
	O_4	5	3	6	10	20
Requirements		20	40	30	10	

(c) Solve the following transportation problem by least cost method : 10 Marks

	D_1	D_2	D_3	D_4	Supply
O_1	6	4	1	5	14
O_2	8	9	2	7	16
O_3	4	3	6	2	5
Demand	6	10	15	4	

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