Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY

FACULTY OF MANAGEMENT

BBA Summer 2018 - 19 Examination

Semester: 5 **Date: 13/05/2019**
Subject Code: 06191306 **Time: 2:00 pm to 4:30 pm**
Subject Name: Operations Research **Total Marks: 60**

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed.

A). Multiple choice type questions. (Each of 1 mark) **(05)**

1. The best use of linear programming technique to find an optimal use of
   a) Money
   b) Machine
   c) Manpower
   d) All of the above
2. The solution to a Transportation problem with m rows and n columns is feasible if number of positive allocations are,
   a) $m - n$
   b) $m + n$
   c) $m + n - 1$
   d) $m + n + 1$
3. Which method is used to verify the optimality of the current solution of the Transportation problem
   a) Least cost method
   b) MODI
   c) Vogel's approximation method
   d) All of the above
4. Maximization problem in the Assignment Problem is transformed into a minimization problem by
   a) Adding each entry in a column from the maximum vale that column
   b) Subtracting each entry in a table from the maximum value in that table
   c) Subtracting each entry in a column from the maximum value in that column
   d) None of these
5. A balanced transportation problem is,
   a) Supply=demand
   b) supply>demand
   c) supply is not equal to demand
   d) none of these

B). Define the following. (Each of 1 mark) **(05)**

1. Rules of Dominance in game theory.
2. Feasible Solution in LPP.
3. Assignment Problem
4. Transportation Problem.
5. Artificial variable in LPP.

C). Direct questions.(Each of 1 mark) **(05)**

1. Slack variable in LPP.
2. Saddle point in game theory.
3. Full form of CPM.
4. Group replacement policy.
5. Write General mathematical formulation of LPP.

Q.2 Answer the following questions.

A). Use the graphical method to solve the following LP problem. **(07)**

Maximize Z=10x+ 6y

Subject to constraints,

$$5x + 3y \leq 30$$
$$x + 2y \leq 18$$
$$x, y \geq 0$$

B). Find initial feasible solution of following problem by North west corner method, **(08)**

	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	34

Q.3 Answer the following questions.

A). A department of a company has five employees with five jobs to be performed. The time in hours that each man takes to perform each job is given in the matrix form, **(07)**

	1	2	3	4	5
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

How should the jobs be allocated, one per employee, so as to minimize the total man –hours?

B). The data collected in running machines, the cost of which Rs 60000 are given below: **(08)**

Year	1	2	3	4	5
Resale Value	42000	30000	20400	14400	9650
Cost of spares	4000	4270	4880	5700	6800
Cost of Labour	14000	16000	18000	21000	25000

When machine should be replaced?

Q.4 Attempt any two questions. (Each of 7.5 mark) **(15)**

A) Solve the following games by using maxmin or minmax principle, whose payoff matrix is given below: include in your answer: strategy selection for each player and the value of game.

Player A/ Player B	B_1	B_2	B_3	B_4
A_1	1	7	3	4
A_2	5	6	4	5
A_3	7	2	0	3

B) Write difference between CPM and PERT.

C) Find initial basic feasible solution to the following transportation problem by Least cost method,

	1	2	3	4	Supply
A	21	16	15	3	11
B	17	18	14	23	13
C	32	27	18	41	19
Demand	6	6	8	23	