

MCA II Semester Regular & Supplementary Examinations May/June 2019

OPERATIONS RESEARCH

(For students admitted in 2017 and 2018 only)

Time: 3 hours

Max. Marks: 60

Answer all the questions

- 1 'Operations research models enable to conduct a number of experiments involving theoretical subjective manipulations to find some optimum solution to the problem on hand'. Discuss it.

OR

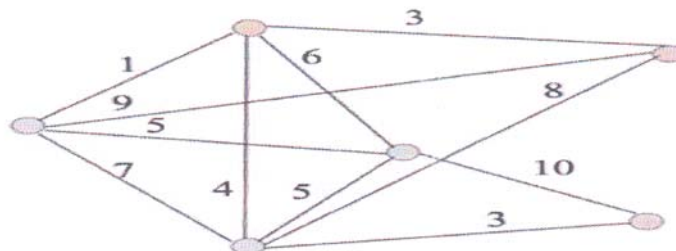
- 2 PARLOK Ltd has two products Heaven and Hell. To produce one unit of Heaven, 2 units of material X and 4 units of material Y are required. To produce one unit of Hell, 3 units of material X and 2 units of material Y are required. Only 16 units of material X and 16 units of material Y are available. Material X cost Rs.2.50 per unit and material Y cost Rs.0.25 per unit respectively.

- 3 Find the optimum transportation cost the following transportation problem:

	D ₁	D ₂	D ₃	D ₄	Availability
S ₁	2	3	2	5	40
S ₂	4	4	3	2	60
S ₃	5	3	6	10	40
Requirement	30	50	40	20	

OR

- 4 Given a set of locations and possible roads to be built between pairs of cities with the associated costs, determine the minimum cost road network connecting all the locations (Apply minimum spanning tree algorithm)



- 5 (a) Distinguish between simplex and revised simplex algorithm in detail.
(b) Discuss the importance of parametric linear programming.

OR

- 6 Solve, using the cutting-plane algorithm. Illustrate the cuts on a graph of the feasible region.
 $z = \text{Max } z = 5x + 8y$
 Subject to: $x + y \leq 6$, $5x + 9y \leq 45$
 $x, y \geq 0$ and integer.

- 7 Discuss the significance of simulated annealing algorithm in detail.

OR

- 8 Enumerate the applications of metaheuristics to integer linear programs.

- 9 Solve the following LPP by dynamic programming:

$$\text{Maximize } Z = 2x + 3y$$

$$\text{Subject to } x - y \leq 1$$

$$x + y \leq 3$$

$$x, y \geq 0$$

OR

- 10 Explain travelling salesperson problem algorithm with suitable example.