PART C — (1 × 15 = 15 marks)

16. (a) Unit profit of five salesmen in four places are given below

	S_1	S_2	S_3	S_4	S_5	Available
P_1	5	6	4	2	6	40
P_2	7	9	5	2	5	50
P_3	3	3	3	2	4	60
P_4	7	8	5	4	4	50
Demand	40	30	40	40	30	

Solve the problem to maximize the profit.

Or

(b) Solve the integer programming problem

Maximize $Z = 80x_1 + 45x_2$

Subject to

$x_1 + x_2 \leq 7$

$12x_1 + 5x_2 \leq 60$

and $x_1, x_2 \geq 0$ and integer.

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 52877

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Seventh Semester

Computer Science And Engineering

CS 6704 – RESOURCE MANAGEMENT TECHNIQUES

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is OR techniques? Where it can be used?

2. Define following terms. (a) Solution (b) Feasible solution.

3. Explain degeneracy in transportation problem.

4. Write down the steps of North West Corner Method for solving transportation problem.

5. Why integer programming is needed? Generalize it.

6. Summarize the main disadvantage of the branch and bound method.

7. List the uses of classical optimization theory.

8. Describe the concepts of Lagrangian multiplier.

9. Illustrate the primary rules for Network construction.

10. Point out the uses of GANTT chart.

PART B — (5 × 13 = 65 marks)

11. (a) Solve by Simplex Method

(i) Max $Z = 3x_1 + 4x_2$

Subject to the conditions

$2x_1 + 4x_2 \leq 120$; $2x_1 + 2x_2 \leq 80$; $x_1 \geq 0, x_2 \geq 0$.

(ii) Maximize $Z = 3x_1 + 2x_2 + 5x_3$

Subject to Constraints

$x_1 + x_2 + x_3 \leq 9$; $2x_1 + 3x_2 + 5$; $x_3 \leq 30$; $2x_1 - x_2 - x_3 \leq 8$ and $x_1, x_2, x_3 \geq 0$.

Or

(b) The advertising alternative for a company include television, radio, and newspaper advertisements. The costs and estimates for audience coverage are given in the table below.

	Television	Radio	Newspaper
Cost per advertisement	£2,000	£300	£600
Audience per advertisement	1,00,000	18,000	40,000

The local newspaper limits the number of weekly advertisements from a single company to ten. Moreover, in order to balance the advertising among the three types of media, no more than half of the total number of advertisements should occur on the radio, and at least 10% should occur on television. The weekly advertising budget is £18,200. How many advertisements should be run in each of the three types of media to maximize the total audience?

12. (a) Find the initial feasible solution for the following problem using North West Corner Method. Optimize solution using stepping stone.

Consumption centres	Warehouses				Requirements (Units)
	P1	P2	P3	P4	
C1	10	4	9	5	25
C2	6	7	8	7	25
C3	3	8	6	9	25
Capacity	9	28	20	18	

Or

(b) Solve by Vogel"s Approximation Method.

Plants	Warehouses					Supply
	W1	W2	W3	W4	W5	
P1	20	28	32	55	70	50
P2	48	36	40	44	25	100
P3	35	55	22	45	48	150
Demand	100	70	50	40	40	300

13. (a) Discuss Gomary's Cutting plane method and solve it. Maximize $z = x_1 + 4x_2$ Subject to $2x_1 + 4x_2 \leq 7$, $5x_1 + 3x_2 \leq 15$; x_1, x_2 are integers ≥ 0.

Or

(b) Summarize and find the optimum integer solution to the following all I.P.P:

Maximize $z = x_1 + 2x_2$

Subject to $2x_2 \leq 7$; $x_1 + x_2 \leq 7$; $2x_1 \leq 11$; $x_1, x_2 \geq 0$ and integers.

14. (a) Discuss the Non Linear programming problem and solve by using Legrange multipliers with equality constraints.

Maximize $Z = 4x_1 - 0.1x_1^2 + 5x_2 - 0.2x_2^2$

Subject to $x_1 + 2x_2 = 40$; $x_1, x_2 \geq 0$

Or

(b) Describe in detail about the Newton-Raphson method.

15. (a) A project has the following characteristics. Construct a own PERT network. Find critical path and variance for each event and also analyze it.

Or

(b) A project consists of the following activities as shown in table. The duration in weeks and the manpower requirement for each of the activities are also summarized in the same table. Find and give the project schedule which minimizes the peak manpower requirement and also minimizes period-to-period variation in manpower requirement (number of iteration = 2).

Activity	Duration (months)	Manpower Required
1-2	5	12
1-3	6	4
2-3	8	6
2-4	7	3
3-4	4	8
2-5	1	4
3-5	6	3
5-6	7	4
4-6	5	2