

B.Tech III Year II Semester (R09) Supplementary Examinations May/June 2016

OPTIMIZING TECHNIQUES

(Common to CSE and CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Determine the minimum of:

$$f(x) = (10x^3 + 3x^2 + x + 5)^2$$

Starting at $x = 2$ and using a step size $\Delta = 0.5$ using quadratic point estimation method.
- 2 Minimize $f = 2x_1^2 + x_2^2$ by using the Cauchy method with the starting point (1, 2) (two iterations only).
- 3 Solve the following LP problem using graphical method and give your comment on the result:
 Maximize $Z = 40 X_1 + 100 X_2$
 Subject to $2 X_1 + X_2 \leq 500$
 $2 X_1 + 5 X_2 \leq 1000$
 $X_1, X_2 \geq 0$
- 4 Find the optimal solution for the following transportation problem. The cell entries represent the unit transportation cost in rupees from each origin to each destination.

		Destination				Availability
		D ₁	D ₂	D ₃	D ₄	
Origin	O ₁	1	2	1	4	20
	O ₂	3	3	2	1	40
	O ₃	4	2	5	9	20
	O ₄	5	3	6	10	20
Demand		4	7	6	13	
- 5 Write the Kuhn-Tucker conditions for the following problem and solve it:
 Minimize $Z = x_1^2 + x_2^2 + x_3^2$
 subject to constraints: $2x_1 + x_2 \leq 5$
 $x_1 + x_3 \leq 2$
 $1 - x_1 \leq 0$
 $2 - x_2 \leq 0$
 $x_3 \geq 0$
- 6 What is penalty function concept? Explain interior penalty function algorithm.
- 7 (a) Explain the concepts of "branching" and "bounding" used in the branch and bound algorithm.
 (b) What is the meaning "Fathoming" a node? Under what conditions can a node be fathomed in the branch and bound algorithm?
- 8 Draw the network diagram from the following activities and find critical path and total float and free float of activities.

Job	A	B	C	D	E	F	G	H	I	J	K
Job time	13	8	10	9	11	10	8	6	7	14	18
Immediate predecessor	-	A	B	C	B	E	D, F	E	H	G, I	J