S.18

Code No.: 9A05603/R09

B.Tech. III Year II Semester Regular and Supplementary Examinations **Set-2**

April/May - 2013

OPTIMIZING TECHNIQUES

(Common to CSE and CSS)

Time: 3 Hours Max. Marks: 70

*Answer any **FIVE** Questions*

*All Questions carry **Equal** Marks*

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1. (a) Suppose a point satisfies sufficiently conditions for a local minimum. How do you establish that is a global minimum?

   (b) Are region elimination methods as a class more efficient than point estimation methods. Why or why not?

2. Find the minimum of $f = x(x - 1.5)$ in the interval (0.0, 1.0) using interval having method to within 10% of the exact value.

3. Solve the following LP problem using simplex method,

   Maximize $Z = 2X_1 + 4X_2 + 3X_3$

   Subject to $3X_1 + 4X_2 + 2X_3 \le 60$

   $2X_1 + X_2 + 2X_3 \le 40$

   $X_1 + 3X_2 + 2X_3 \le 80$

   $X_1, X_2, X_3 \ge 0.$

4. An air line that operates seven days a week has time table shown below. Crews must have a minimum layover of 4 hours between flights. Obtain the pairing of flights that minimize layover time away from home. For any given pairing the crew will be based at the city that results in the smaller layover. For each pair also mention the town where the crew should be placed.

City A to City B			City B to City A		
Flight No.	Departure	Arrival	Flight No.	Departure	Arrival
1	7.00 Hrs	8.00 Hrs	1	8.00 Hrs	9.15 Hrs
2.	8.00 Hrs	9.00 Hrs	2	8.30 Hrs	9.45 Hrs
3.	13.30 Hrs	14.30 Hrs	3	12.00 Hrs	13.15 Hrs
4.	18.30 Hrs	19.30 Hrs	4	17.30 Hrs	18.45 Hrs

5. Using the method of Lagrangian multipliers, solve the non-linear programming problem.

   Maximize $Z = 6x_1 + 8x_2 - x_1^2 - x_2^2$

   Subject to the constraints $4x_1 + 3x_2 = 16$

   $3x_1 + 5x_2 = 15$

6. (a) Explain method of multipliers (MOM) characteristics.

   (b) Under what conditions does the MOM produce no distortion in the curvature of the penalty function contours from stage to stage.

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7. Solve the following nonlinear programming problem.

   Minimize $Z = x_1^2 + x_2^2 + 5$

   Subject to $3x_1^4 + x_2 \leq 16$

   $x_1 + 2x_2^2 \leq 32$

   $x_1, x_2 \geq 0.$

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8. A man is engaged in buying and selling identical items. He operates from a ware house that can hold 500 items. Each month he can sell any quantity that he chooses up to the stock at the beginning of the month. Each month he can buy as much as he wishes for delivery at the end of the month so as his stock does not exceed 500 items. For the next four months, he has the following error-free forecasts for cost sales prices.

Month	I	1	2	3	4
Cost	C_i	27	24	26	28
Sales price	P_i	28	25	25	27

If he currently has a stock of 200 units, what quantities should he sell and buy in next four months. Find the solution using dynamic programming.