Code: 9A05603 **R09**

B.Tech III Year II Semester (R09) Supplementary Examinations December/January 2015/2016

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 Carry out a single-variable search to minimize the function:

$f(x) = 3x^2 + \frac{12}{x^3} - 5$ on the interval $\frac{1}{2} \le x \le \frac{5}{2}$

Using golden section method (use four functional evaluations only).

2 Minimize $f = 4x_1^2 + 3x_2^2 - 5x_1x_2 - 8x_2$ starting from the point (0, 0) using Powell's method. Perform two iterations.

3 Solve the following LP problem using Simplex method and comment on the result:

Maximize $Z = 3X_1 + 2X_2$

$X_1 - X_2 \le 1$

$X_1 + X_2 \ge 3$

$X_1, X_2 \ge 0$

4 Describe the transportation problem. Formulate the transportation problem as a linear programming problem.

5 (a) Define a convex programming .What is the Lagrangian function associated with it?

(b) Solve the following non-linear programming problem using Kuhn-Tucker conditions.

Minimize $Z = -\log x_1 - \log x_2$

subject to the constraint

$x_1 + x_2 \le 2$ and $x_1, x_2 \ge 0$

6 Solve the following problem using MOM technique:

Minimize $f(x) = (x_1 - 1)^2 + (x_2 - 1)^2$

subject to $-x_1 \le 0$

$-x_2 \le 0$

$x_1^2 + x_2^2 - 1 \le 0$

7 What is meant by quadratic programming? How does a quadratic programming problem differ from a linear programming problem? Give an example.

8 (a) What is a critical path? Why is it so important in scheduling and controlling large projects? Can a critical path change during the course of a project? Why?

(b) A project has the following characteristics:

Activity	1-2	1-4	1-7	2-3	3-6	4-5	4-8	5-6	6-9	7-8	8-9
Duration	3	2	1	3	2	4	6	5	4	4	5

Construct a network and find critical path, total duration of the project.