Code No: **R41028** **R10** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

OPTIMIZATION TECHNIQUES

(Open Elective)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) What are the various applications of optimization problems? [8]
b) What is the significance of the conditions of variables in optimization problems? [7]

2 a) Explain with the help of examples, how optimization problems are classified based on:
i) Single value objective function
ii) Multi value objective function [8]
b) State and explain the necessary conditions for existence of relative optima in case of multivariable objective functions with and out constraints. [7]

3 a) Explain graphical method of solving LPP. [8]
b) How is the pivot reduction method applied for finding the solutions of linear simultaneous equations? [7]

4 a) What are shadow prices in transportation problem? Explain it. [8]
b) Solve the following transportation problem. [7]

				Availability
	0	2	0	70
	1	4	0	30
	0	2	4	50
Requirement	70	50	30	

5 Define the following
a) Gradient of a function
b) Steepest descent direction using contour representation. [15]

6 Draw the flow chart for the univariate method, explain about each block in the flow chart. [15]

7 a) What do you understand by the term 'penalty' in a constrained multivariable optimization problem? Explain how it is used to optimize multidimensional nonlinear programming problems. [8]
b) Discuss convex Programming Problem with an example. [7]

8 a) Explain in detail the principle of optimality [5]
b) Use dynamic programming technique to solve the following problem.
Max $Z = X_1.X_2.X_3.X_4$
Subject to $X_1 + X_2 + X_3 + X_4 = 12$
$X_1, X_2, X_3, X_4 \geq 0$ [10]