Code: 13A02607 **R13**

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017

OPTIMIZATION TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Discuss about design vector.
(b) Explain constraint surface.
(c) Define optimal control problem.
(d) Explain multi objective programming problem.
(e) What is saddle point?
(f) Explain Newton's method.
(g) Discuss characteristics of constrained problem.
(h) Explain convex programming problem.
(i) Discuss dynamic programming.
(j) Where the tabular method of solution is used? Explain.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Find the extreme points of the function: $f(x_1, x_2) = x_1^3 + x_2^3 + 2x_1^2 + 4x_2^2 + 6$

OR

3 Find the dimensions of a box of largest volume that can be inscribed in a sphere of unit radius.

UNIT – II

4 Minimize $f(Y) = \frac{1}{2}({y_1}^2 + {y_2}^2 + {y_3}^2 + {y_4}^2)$

Subject to $g_1(Y) = y_1 + 2y_2 + 3y_3 + 5y_4 - 10 = 0$

$g_2(Y) = y_1 + 2y_2 + 5y_3 + 6y_4 - 15 = 0$

OR

5 Minimize $f(x, y) = Kx^{-1}y^{-2}$, subject to $g(x, y) = x^2 + y^2 - a^2 = 0$

UNIT – III

6 Find the dimensions of a cylindrical tin with top and bottom made up of sheet metal to maximize its volume such that the total surface area is equal to $A_0 = 24\pi$.

OR

7 Find maximum of the function: $f(x) = 2x_1 + x_2 + 10$, subject to $g(x) = x_1 + 2x_2^2 = 2$.

UNIT – IV

8 Discuss basic approach of penalty function.

OR

9 Explain interior and exterior penalty functions.

UNIT – V

10 Explain multistage dynamic programming decision process.

OR

11 Discuss concept of sub optimization in detail.

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