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Question Paper Code :

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

M.E/M.Tech I-Semester Regular Examinations, November 2015

ADVANCED OPTIMIZATION TECHNIQUES
(MACHINE DESIGN)

Date:

Time: 3 hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT-I

- a) What is the difference between a 'Posynomial' and a 'polynomial'. Define a Generalized polynomial? 6M
b) Minimize the following function $f=4x_1^{-2}x_2^{-1}+x_1^2$? 6M
- OR**
- a) Using Geometric programming find the dimensions of the rectangle of maximum area which can be inscribed in a circle of radius r? 6M
b) What is meant by normality condition in a Geometric programming problem? 6M

UNIT-II

- a) Explain Multistage Decision process? 6M
b) Explain continuous Dynamic programming? 6M
- OR**
- Solve the LPP problem using dynamic programming technique 12M

Maximize $f(x_1, x_2) = 10x_1 + 8x_2$

Subjected to $2x_1 + x_2 \leq 25$

$3x_1 + 2x_2 \leq 45$

$x_2 \leq 10, x_1, x_2 \geq 0$

UNIT-III

- Solve the problem Using Gomory's' Cutting plane method: 12M
Maximize $Z = 40x_1 + 36x_2$
Subject to $5x_1 + 3x_2 \geq 45, x_1 \leq 8, x_2 \leq 10, x_1, x_2 \geq 0$

OR

6. a) What is Branch and Bound Method ? Explain ? 6M
b) What are the disadvantages of truncating the functional part of a continuous solution for an integer problem? 6M

UNIT-IV

7. a) What is stochastic programming? Give some application areas of stochastic programming? 6M
b) A Contractor plans to use four tractors to work on a project in a remote area. the probability of a tractor functioning for a year without break down is known to be 80%.if X denotes number of tractors operating at the end of year, determine the probability mass and Distribution functions of X ? 6M

OR

8. a) What is the difference between probability density and probability distribution functions? 6M
b) How is stochastic return function handled in stochastic Dynamic programming? 6M

UNIT-V

9. Explain Optimization of fuzzy Systems? 12M

OR

10. a) How is the Cross over operation performed in GAS? 6M
b) How is a neuron modeled in a neural network models? 6M