Reg. No. : | | | | | | | | | | |

Question Paper Code: 52106

M.E. DEGREE EXAMINATION, MAY 2017

Elective

CAD / CAM

15PCD526 – ADVANCED OPTIMIZATION TECHNIQUES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

(5 x 20 = 100 Marks)

1. (a) Consider the function: f (x) = x1+2x2 +x1x2-x_1^2-x_2^2. Determine the maximum or minimum point (if any)of the function. (20)

Or

(b) Explain the necessary condition for local minimum and maximum value. (20)

2. (a) Describe the architecture of feed forward neural network in detail. Also discuss the variants of back propagation algorithm with an example. (20)

Or

(b) Explain Kuhn-Tucker sufficient condition for function. (20)

3. (a) Explain the unconstrained optimization methods. (20)

Or

(b) Explain the working principle of simulated annealing with a neat flow chart. (20)

4. (a) Consider a single machine system where the CTMC model has three states. S (setup=20per hour), P(processing= 4 per hour) and R(undergoing repair=1 per hour) and f(failure rate =0.05 per hour). The machine goes from setup state to processing state with a probability of s, and processing state to repair state with a probability of f, and repair state to processing state with a probability of r and processing state to setup state with a probability of p. Write down the rate balance equations and obtain the steady state probabilities. (20)

Or

(b) Write the expression for Newton-Raphson method. (20)

5. (a) For the problem given in question number 15a, apply the Simulated annealing Algorithm to obtain near optimal value for the variables. (20)

Or

(b) Consider the slider crank mechanism and explain its design methodology. Identify the parameters to be optimized and propose the techniques to solve the problem. (20)

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