Subject Code: H1501/R13

M. Tech –II Semester Regular/ Supply Examinations, October, 2015
OPTIMIZATION AND RELIABILITY
(Common to MD, MED and CAD/CAM)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks
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1. (a) State the principle behind the method of constrained variation.
    (b) Find the maxima and minima, if any, of the function
    $f(x) = 4x^3 - 18x^2 + 27x - 7$

2. Minimize $f(x_1, x_2) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$. Take the points defining the initial simplex as $\mathbf{X}1 = (4.0, 4.0)^T$, $\mathbf{X}2 = (5.0, 4.0)^T$, and $\mathbf{X}3 = (4.0, 5.0)^T$ and $\alpha = 1.0$, $\beta = 0.5$, and $\gamma = 2.0$. For convergence, take the value of ε as 0.2.

3. Construct the φk function, according to **(a)** interior and **(b)** exterior penalty function methods and plot its contours for the following problem:
    Maximize $f = 2x$ subject to $2 \le x \le 10$

4. (a) Explain the working principle of genetic algorithm.
    (b) What is random population generation? Explain with an example.

5. (a) How do you select the length of the binary string to represent a design variable?
    (b) What are the drawbacks of genetic algorithm? Explain.

6. (a) Explain Pareto's analysis.
    (b) What is Non-dominated sorted GA? Explain.

7. Explain the optimization model of a weight of a cantilever beam

8.   Explain
        a. Nelder Mead's Simplex method
        b. Types of penalty methods for handling constraints.

Subject Code: H6805/R13
M. Tech –II Semester Regular/ Supply Examinations, October, 2015
ADVANCED MECHANICS OF SOLIDS
(Common to SE &SD, SM&FE, GE)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks
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1. Explain the significance of Fast Transform techniques. What are the advantages over DFT?

   b. Find DFT of a sequence x(n) = { 0,1,1,-1,,-1,0,-1,1} using DIFFFT algorithm.

2. a. Explain the Sources of error in DSP implementations

   b. With neat example Explain the procedural steps of Overlap add method

3. a. Explain the features for external interfacing.

   b. Briefly discuss about the floating point and block floating point formats

4. a. Explain the Data Addressing modes of TMS320C54XX DSPs.

   b. Explain the Interrupts of TMS320C54XX Processors

5.a. How the shifters are useful in DSP? Explain the functionality of barrel shifter?

   b. Explain the base architecture of ADSP 2181

6. a.Explain the Bus Architecture of   Black fin Processor

   b. Explain the significance of External bus interfacing signals

7.a. What are the characteristics of analog devices family of DSP devices?

   b. Briefly discuss about the floating point and block floating point formats

8. Write short notes on the following

   a.   D/A Conversion Errors   b. On-Chip Peripherals