CE 515

Tutorial # 03

Q. No. 1	GA is used to solve the following maximization problem. $$Maximize\ f(x) = \lvert\sin(\pi x)\rvert$$ $$0 \le x \le 2$$ The initial solutions generated randomly are 100101, 001100, 111010, 101110, 101111, 100101. Calculate expected count of each solution.
Q. No. 2	For the objective function given below, calculate fitness value of the binary strings, 0110110011, 1010111100, 0010001110, 1111001101 and 1100110001 if first six bits represent the variable x and the rest bits represent the variable y . Take lower and upper bounds of x and y as 0 and 5. $Min\ f(x,y) = (x^2 + y - 11)^2 + (x + y^2 - 7)^2$ Convert the minimization problem to a maximization problem using appropriate transformation technique.
Q. No. 3	Consider the following problem Minimization $f = x_1^2 - x_2$ Subject to $$26 \ge x_1^2 + x_2^2$$ $$x_1 + x_2 \ge 6$$ $$x_1 \ge 0$$ Determine whether the following search direction is usable, feasible or both at the design vector $X = \begin{pmatrix}5\\1\end{pmatrix}$ $$S = \begin{pmatrix}0\\1\end{pmatrix}, S = \begin{pmatrix}-1\\1\end{pmatrix}, S = \begin{pmatrix}1\\0\end{pmatrix}, S = \begin{pmatrix}-1\\2\end{pmatrix}$$
Q. No. 4	For the function given below, obtain the minimum point along the line joining the point $(-3,-4)^T$ and $(3,2)^T$. Take $x_0 = (-3,-4)^T$. $$f = 2 + (x_1^2 - x_2)^2 + x_2^2$$