Code No: K0224 **R07** **Set No. 1**

IV B.Tech. II Semester Supplementary Examinations, July/August - 2017

OPTIMIZATION TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Differentiate between single variable and multivariable optimization.
   b) Explain i) design vector ii) design variables and iii) feasible region.

2. a) Find the maxima and minima, if any of $f(x)=\frac{x^4}{(x-1)(x-3)^3}$
   b) Explain relative and global minima and maxima for a single variable optimization problem.

3. Use simplex method to solve the following LP problem minimize Z=5x+6y subject to the following constraints $2x+5y\geq 1500$
   $3x+y\geq 1200$ and $x, y\geq 0$

4. a) With the help of an example discuss unbalanced transportation problem.
   b) Solve the following transportation problem.

			Availability
	30	20	10	800
	5	15	25	500
Requirement	300	300	400	

5. Find the minimum of $f=\lambda^5-5\lambda^3-20\lambda+5$ by quadratic interpolation method.

6. Minimize $f(x_1,x_2)= x_1-x_2+2x_1^2+x_2^2+2x_1x_2$ starting from the point $x_1=\begin{Bmatrix}0\\0\end{Bmatrix}$ by steepest descent method.

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7. Construct the φ_k function, according to
   a) Interior and
   b) Exterior penalty function methods and plot its contours for the following problem.
   Maximize f=2x
   Subject to $2 \leq x \leq 10$

8. Solve the following LPP by dynamic programming approach.
   Max $Z=3x_1+4x_2$,
   Subject to $2x_1+x_2 \leq 40$
   $2x_1+5x_2 \leq 180$
   $x_1, x_2 \geq 0$.