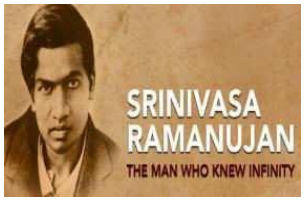
	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB101T Calculus and Linear Algebra	
	UNIT –II **Functions of Several Variables**	

Sl.No.	**Tutorial Sheet -2**	**Answers**
1	Find the extreme values of a function $x^2+y^2+6x+12$	(-3, 0) is the stationary point, minimum value = 3
2	Find the maxima and minima of the function $x^3+3xy^2-15x^2-15y^2+72x$	Max. value is 112 ,when x = 1, y = 2
3	Find the dimensions of the rectangular box, open at the top of maximum capacity whose surface is 432sq.cm.	X = 12, y = 12 and z = 6.
4	A rectangular box, open at the top, is to have a given capacity. Find the dimensions of the box requiring least material for its construction.	Hence s is minimum when x = y = $(2V)^{1/3}$ = 2z.
5	Find the minimum value of xy^2z^3 subject to x + y + z = 24	The extreme points are (4, 8, 12) and the minimum value is $4\times8^2\times12^3$.
6	Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$.	$V=\frac{8abc}{3\sqrt{3}}$.
7	Find the minimum value of $x^2 + y^2 + z^2$ given that ax + by + cz = p.	$f=\frac{p^2}{a^2+b^2+c^2}$
8	Identify the saddle point and extreme points of $f(x, y) = x^4 – y^4 - 2x^2 + 2y^2$	(i) The points (0, 1), (0, -1) are maximum point. (ii) The points $(\pm1,0)$ are minimum point. (iii) The points $(\pm1,\pm1)$ are saddle points.