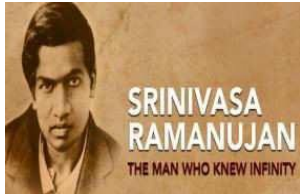
 SRM <small>INSTITUTE OF SCIENCE & TECHNOLOGY (Deemed to be University u/s 3 of UGC Act, 1956)</small>	SRM Institute of Science and Technology Kattankulathur		 SRINIVASA RAMANUJAN <small>THE MAN WHO KNEW INFINITY</small>
	DEPARTMENT OF MATHEMATICS		
	18MAB101T Calculus and Linear Algebra		
	UNIT –II Functions 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 $4 \times 8^2 \times 12^3$.	
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 $(\pm 1, 0)$ are minimum point. (iii) The points $(\pm 1, \pm 1)$ are saddle points.	

