SRM INSTITUTE OF SCIENCE AND TECHNOLOGY DEPARTMENT OF MATHEMATICS 18MAB101T CALCULUS AND LINEAR ALGEBRA ASSIGNMENT-II (November 2020)

- 1. Identify the saddle point and extreme points of $f(x, y) = x^4 y^4 2x^2 + 2y^2$
- 2.A rectangular box open at the top is to have volume of 32cubic feet. Find its dimensions if the total surface area is minimum.

3.a.If
$$u = x^2 + y^2$$
 where $x = s + 3t$ and $y = 2s - t$ find $\frac{\partial u}{\partial s}$ and $\frac{\partial u}{\partial t}$.

b.If
$$z = \sin\left(\frac{x}{y}\right)$$
, $x = e^t$, $y = t^2$ find $\frac{dz}{dt}$.

4. If
$$u = \frac{yz}{x}$$
, $v = \frac{zx}{y}$, $w = \frac{xy}{z}$ show that $\frac{\partial(u,v,w)}{\partial(x,y,z)} = 4$

5.Expand $e^{2x}\cos 2y$ in powers of x and y at $(0, \frac{\pi}{2})$ upto second degree terms.