International Institute for
Technology and Management

Tutoring Sheet # 18

Unit 05a : Mathematics 1

1. a.)Use the Lagrange multiplier method to find the values of x and y That maximize the function $f(x,y) = xy^{2/3}$ subject to the constraint $x + 2y = 100$.

b.) Use the Lagrange multiplier method to find the values of x and y That maximize the function $f(x,y) = 3\sqrt{x} + 4\sqrt{y}$ subject to the constraint $x + y = 100$.

c.)Optimize $f(x,y) = 120x - 4x^2 + 2xy - 3y^2 + 96y - 222$ subject to the constraint $x + 3y = 69$

d.) Use the Lagrange multiplier method to find the values of x and y That maximize the function $f(x,y) = \sqrt{x}\, y^2$ subject to the constraint $x + y = 100$.

2.A firm has weekly production function $q(k,l)=k^{1/4}l^{1/2}$ and the unit weekly costs for capital and labour are $v = 20$ and $w = 10$.
the firm wishes to produce 200 units a week of its good.Find the minimum cost of doing so.

3. *Study Guide* page 95 : **Question 5** .

4. *Study Guide* page 95 : **Question 6** .

5. *Study Guide* page 95 : **Question 7** .

6. *Study Guide* page 95 : **Question 8** .