UNIVERSITY OF CENTRAL PUNJAB, LAHORE

Multivariate Calculus

Assignment#3

Attach this sheet with your assignment.

Name: _____ Reg. _____

Question No.1

Two products are manufactured in quantities q_1 and q_2 and sold at prices of p_1 and p_2 respectively. The cost of producing them is given by $C = 2q_1{}^2 + 2q_2{}^2 + 10$.

    a. Find the maximum profit that can be made, assuming the prices are fixed.
    b. Find the rate of change of that maximum profit as p_1 increases.

Question No.2

For $f(x,y) = A - (x^2 + Bx + y^2 + Cy)$, what values of A, B and C give f a local maximum value of 15 at the point $(-2,1)$?

Question No.3

Show that the function

$$Z = bX^a Y^{1-a}$$

Satisfy the equation

$$X \frac{\partial Z}{\partial X} + Y \frac{\partial Z}{\partial Y} = Z$$