Calculus II

Assignment 6

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Name : _____

Student ID : _____

1. Find the local maximum and minimum values and saddle point(s) of the function.
   (a) $f(x, y) = x^2 + xy + y^2 + y$
   (b) $f(x, y) = y \cos x$
2. Find the shortest distance from the point $(2, 0, -3)$ to the plane $x + y + z = 1$.
3. Find the dimensions of the rectangular box with largest volume if the total surface area is given as 64 cm^3.
4. Use Lagrange multipliers to find the maximum and minimum values of the function subject to the given constraint.
   $f(x, y) = 3x + y; \quad x^2 + y^2 = 10$
5. *Find the global maximum and minimum values of f on the set D.
   $f(x, y) = 4x + 6y - x^2 - y^2$
   $D = \{(x, y) \big| 0 \leq x \leq 4, 0 \leq y \leq 5\}$

Notice : * is an optional question.

Reading materials : Textbook Section 15.7 and 15.8.