

# QUIZ 7

(25MINS, 30PTS)

Please write down your name, SID, and solutions discernably.

Name :

SID :

Score :

1. (10pts) Use Lagrange multipliers to find the maximum and minimum values of the functions subject to the given constraint.

$$f(x, y) = 3x + y; \quad x^2 + y^2 = 10$$

2. (10pts) Find the local maximum and minimum values and saddle point(s) of the function. Please give the value of maximum or minimum as well as the points at which the values are attained.

$$f(x, y) = xy(1 - x - y)$$

3. (10pts) Find the absolute maximum and minimum values of

$$f(x, y) = x^4 + y^4 - 4xy + 2$$

on the set  $D = \{(x, y) : 0 \leq x \leq 3, 0 \leq y \leq 2\}$ .