

Name:.....Serial#:.....Sec #:.....

Q.1: Find the point on the plane $x + 2y + z = 4$ that is closest to the point $(1, 0, -2)$. Also find the shortest distance of $(1, 0, -2)$ from the plane.

Q.2: Find the local maximum and local minimum values of the function $f(x, y) = 9 - 2x + 4y - x^2 - 2y^2$.

Q.3: Use Lagrange Multipliers to find the maximum and minimum values of the function $f(x, y) = x^2 - y^2$ subject to the constraint $x^2 + y^2 = 1$.