King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 470 Quiz 5

Name : ..... **ID** #.....

Question: Let $D(x, \epsilon)$ be the disk in R^2 centered at x and with radius ϵ. Let n denote the exterior unit normal to $\partial D(x, \epsilon) = C(x, \epsilon)$.

Verify if the following boundary value problem has at most one solution $u = u(y_1, y_2)$.

$$-\nabla^2 u + u = \sin(x + y_1) \quad in \quad D$$
$$\partial_n u + u = \cos(x + y_2) \quad on \quad C.$$