King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math-201 Semester-101 QUIZ V

NAME: S.No. ID:

Maximum Marks: 10 Section:08 Time Allowed: 20 minutes

(a) The directional derivative of $f(x,y)$ at $(1,1)$ in the direction of $\bar{u}_1 = \bar{i}$ is $\sqrt{2}$ and in the direction $\bar{u}_2 = \frac{1}{\sqrt{2}}\bar{i} + \frac{1}{\sqrt{2}}\bar{j}$ is -3. Find the directional derivative of $f(x,y)$ at $(1,1)$ in the direction of $\bar{u}_3 = \frac{2}{\sqrt{7}}\bar{i} + \frac{3}{\sqrt{7}}\bar{j}$.

(b) Find the local maximum, local minimum and saddle points of a function $f(x,y) = -y^3 + 4xy - 2x^2 + 1$.