King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math-301 Semester-132 QUIZ II

NAME: S.No. ID:

Maximum Marks: 10 Section:06 Time Allowed: 40 minutes

(1) Use Green's theorem to evaluate $\oint_C (x^2 - y^2)dx + (2y - x)dy$, where C consists of the boundary of the region in the first quadrant that bounded by $y = x^2$ and $y = x^3$

(2) Find a parametrization of the cylinder $(x-4)^2 + y^2 = 16; 0 \leq z \leq 5$.

(3) Use Stokes theorem to compute the integral $\int\int_S Curl\mathbf{F}.\mathbf{n}dS$, where $\mathbf{F}(\mathbf{x}, \mathbf{y}, \mathbf{z}) =< xz, yz, xy >$ and S is the part of the sphere $x^2 + y^2 + z^2 = 3$ that lies inside the cylinder $x^2 + y^2 = 2$ and above the xy -plane.

(4) Evaluate $\int\int_S \mathbf{F}.\mathbf{n}dS$, where $\mathbf{F}(\mathbf{x}, \mathbf{y}, \mathbf{z}) =< y, x, z >$ and S is the boundary of the solid region enclosed by $z = 1 - x^2 - y^2$ and the plane $z = 0$.