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:03   Time Allowed: 40 minutes

(1) Show that $\mathbf{F}(\mathbf{x}, \mathbf{y}) = (xy + cosy)\,\vec{i} + (\frac{1}{2}x^2 - x\ siny)\,\vec{j}$ is a conservative field and find its potential. Then , evaluate $\int_{(0,0)}^{(1,2)} \mathbf{F}.d\mathbf{r}$.

(2) Find a parametrization of the cylinder $x^2 + (y - 3)^2 = 9; 0 \leq z \leq 5$.

(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 $x^2 + y^2 + z^2 = 4$ that lies inside the cylinder $x^2 + y^2 = 1$ and above the xy -plane.