King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 301 – Term 181 – Quiz 2

Name:
Student ID #:
Section #:

Question 1. Use Stokes' theorem to evaluate the line integral

$$\oint_C xz\,dx + yz\,dy + xy\,dz$$

where C is the boundary of the surface $z = 2 - y^2$, $y \geq 0, z \geq 0, 0 \leq x \leq 1$ oriented counter clockwise.

QUESTIONS 2 IS ON THE BACK OF THE PAGE.

Question 2. Use divergence theorem to evaluate

$$\iint_S (xy\,\mathbf{i} - \frac{1}{2}y^2\,\mathbf{j} + z\mathbf{k}) \cdot \mathbf{n}\, dS$$

where S is the surface that consists of three parts: $z = 4 - 3x^2 - 3y^2$, $1 \leq z \leq 4$ at the top, $x^2 + y^2 = 1$, $0 \leq z \leq 1$ on the sides and $z = 0$ at the bottom.