CALCULUS II
2019 Fall Semester Final Exam

Dept. or School		Year		proctor	
Student ID		Name			

※ **Your answer must be provided with descriptions how to get the answer.**

1. **(5 points)** Find the absolute maximum and minimum values of the function $f(x,y)=x^2+y^2-2x-2y+2$ on the disk $S=\{(x,y)\,|\,x^2+y^2\le 4\}$.

2. **(5 points)** Find the local extreme values of $f(x,y)=3y^2-2y^3-3x^2+6xy$.

3. (5 points) There is a positive number a such that the volume of the solid bounded by the plane $z=0$ and the paraboloid $z=a-x^2-y^2$ is equal to the area of the part of the paraboloid $z=a-x^2-y^2$ that lies above the plane $z=0$. Find the least integer l such that $a \leq l$.

4. (a)(5 points) Evaluate double integrals

$$\int_1^6 \int_0^y \left(\frac{3}{x^2+y^2} + e^{\frac{x}{y}} \right) dx\, dy$$

(b)(3 points) In evaluating a double integral over a region D, a sum of iterated integrals was obtained as follows

$$\iint_D f(x,y)dA = \int_0^1 \int_1^{e^y} f(x,y)dxdy + \int_1^e \int_1^{1+e-y} f(x,y)dxdy$$

Express the double integral as an iterated integral with reversed order of integration.

CALCULUS II 2019 Fall Semester Final Exam	Dept. or School		Year		proctor	
	Student ID		Name			

5. (a)(6 points) Evaluate $\int_C F \cdot dr$ where $F(x,y) = < 3y+1, \sqrt{y^6+1} >$ and C is the upper half of the circle $x^2+y^2=1$ from $(1, 0)$ to $(-1, 0)$.

(b)(6 points) Evaluate $\int_C F \cdot dr$ where $F(x,y) = < 2xe^{xy} + x^2ye^{xy},\ x^3e^{xy}+2y >$ and C is given by $r(t) = < t\cos(\pi t)-1,\ \sin\left(\frac{\pi t}{2}\right) >$, $0 \le t \le 1$.

6. (5 points) Find the area of the surface with parametric equations

$$x = u\cos v, \quad y = u\sin v, \quad z = v$$

that lies above the triangular region with vertices $(0,0)$, $(1,0)$ and $(1,1)$ in the $uv-$plane.