King Saud University

Department of Mathematics

2 Mid Term Exam **205-Math** **2 Semester (1439/1440)**

Question1 (4)**.** Find the local extreme values of the function $f(x,y)=\frac{x^3}{3}-x+xy^2$

Question2 (4)**.** Find the maximum and minimum values of the function $f(x,y)=x^2+y$

on the circle $x^2+y^2=9$.

Question3 (4)**.** Evaluate the integral $\iint_R \frac{y}{1+x^2}\,dA$ over the region *R* bounded by the graphs:

$$y=0,\quad x=1 \text{ and } \quad y=x\ .$$

Question4 (3)**.** Sketch the region of integration for the integral $\int_0^{\pi}\int_y^{\pi} y^2 \sin x^2\,dx dy$

and write an equivalent integral with the order of integration reversed.

Question5 (4)**.** Find the area of the plane region that is outside the curve $r=a$ and inside the

curve $r=2a\cos\theta$ where $0<a\in\Re$.

Question6 (3)**.** Find the volume of the solid bounded by the surfaces:

$$z=\sqrt{25-x^2-y^2}\ ,\quad z=0 \quad and \quad x^2+y^2=9$$

Question7 (3)**.** Find the surface area of the surface $z=\sqrt{x^2+y^2}$ that lies above the region *R* in

xy-plane bounded by the circle $x^2+y^2=9$.