King Abdul Aziz university		Math 203
Science–Math department		First Second Exam
Second semester (2016)		Time: 90 minutes
Name:		**computer No.:**

Q1: Choose The Correct Answer:(8 marks)

1.If $x = f(t),\ y = g(t)$ are twice differentiable, then $\frac{d^2y}{dx^2} =$

a) $\frac{\frac{d}{dt}(\frac{dy}{dt})}{\frac{d^2x}{dt^2}}$ b) $\frac{\frac{d}{dt}(\frac{dy}{dx})}{\frac{dx}{dt}}$ c) $\frac{\frac{d}{dt}(\frac{dy}{dt})}{\frac{dx}{dt^2}}$

2.The surface area of the curve $x = f(t), y = g(t)\ , a \le t \le b$ that is rotated about the $y-axis$ is:

a) $\int_a^b 2\pi x \sqrt{(\frac{dx}{dt})^2 + (\frac{dy}{dt})^2}\ dt$ b) $\int_a^b 2\pi y \sqrt{(\frac{dx}{dt})^2 + (\frac{dy}{dt})^2}\ dt$ c) $\int_a^b 2\pi x \sqrt{\frac{dx}{dt} + \frac{dy}{dt}}\ dt$

3.The parametric equation of the circle with radius 3 at center $(2,3)$ is , $0 \le t \le 2\pi$

a) $x = 3\cos 2t\ , y = 3\sin 3t$ b) $x = 2 - 3\cos t\ , y = 3 - 3\sin t$

c) $x = 2 + 3\cos t\ , y = 3 + 3\sin t$

4.The Cartesian equation for $r = -3\cos\theta$ is :

a) $x = -3$ b) $x - \sqrt{x^2 + y^2} = 3$ c) $x^2 + 3x + y^2 = 0$

5.Another polar coordinate of $(2, \frac{\pi}{3})$ is :

a) $(-2, \frac{7\pi}{3})$ b) $(-2, \frac{4\pi}{3})$ c) $(2, \frac{4\pi}{3})$

6. The length of the curve: $x = 1 + 3t^2,\ y = 4 + 2t^3,\ 0 \le t \le 1$ is:

a) $2(2\sqrt{2} - 1)$ b) $3(2\sqrt{2} - 1)$ c) $\frac{2}{3}(2\sqrt{2} - 1)$

7. The polar equation of hyperbola with focus of the origin , eccentricity 2 and directix $y = -2$ is:

a) $r = \frac{16}{4 - 4\sin\theta}$ b) $r = \frac{8}{2 - 4\sin\theta}$ c) $r = \frac{4}{4 - \sin\theta}$

8.The Points (x, y) on the curve where the tangent is vertical $x = t^3 - 3t,\ y = t^2 - 3$ is:

a) $(0, -3)$ b) $(0, -3), (-2,2)$ c) $(\pm 2, -2)$

Q2: Solve the Following Questions:

1.Find the Area that it encloses the curve where : $r = 2\cos 3\theta$ (3 marks) $-\frac{\pi}{6} \leq \theta \leq \frac{\pi}{6}$

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2. Study the symmetry of the curve: $r = 1 - 2\sin\theta$. (3 marks)

3. Reduce the equation to the standard from, classify the surface and sketch it.

$4x^2 + y^2 + 4z^2 - 4y - 24z + 36 = 0$ (3.5 marks)

4.Find the eccentricity, identify the conic, given an equation of directrix and sketch the conic. $r = \frac{3}{2-2\cos\theta}$ (2.5 marks)