Prince Sultan University

Department o f Mathematical Sciences

Major II Exam

Semester II, SPRING 2010 (092)

26th April, 2010

MATH 113 – CALCULUS II

Time Allowed : 90 minutes $\left(1\frac{1}{2} \text{ hours}\right)$

Maximum Points: 100 points

Mr. Khaled Naseralla

Name of the student: _____

ID number : _____

Section : ____**219**_____

For All The Students:

- Answer all the questions.
- This exam consists of *a total of 6 pages and 8 questions.*
- Show your working in the space provided for each question.
- Show all the key steps of your work.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem
- Scientific, non-programmable calculators are allowed.
- You may NOT borrow a calculator from anyone.
- You may NOT use notes or any textbook.
- There should be NO talking during the examination.

Question	Maximum score	*Your Score*
1	20	
2 , 3	16	
4 , 5	16	
6	10	
7 , 8	13	
Total	**75**	

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***Q.1 (20 points)*:** Evaluate the following integrals:

a) $\int_0^{12} (1-e^{-\frac{x}{4}})dx$

b) $\int \frac{x^2}{x+1} dx$

c) $\int_0^1 5xe^{x^2+3} dx$

d) $\int e^x (1+e^x)^2 dx$

e) $\int \frac{\ln x}{x(3+\ln x)} dx$

Sketch the Regions

Q.2 (8 points): Find the area of the region bounded by $x - y - 1 = 0$ and $y = x^2 - 3$.

Q.3 (8 points): The region enclosed by $y = \sqrt{x+1}$, $x = 3$, and $y = 0$ is revolved about the line $y = 3$ to create a solid. Find the volume of the generated solid.

Q.4 (8 points): Use the washer's method to find the volume of the solid generated by revolving the region enclosed by $xy = 1$, $y = \frac{1}{2}$, $y = 2$, and $x = 0$ about the $y-axis$

Q.5 (8 points): Find the exact length of the arc of $y = (x-4)^{\frac{3}{2}}$ over the interval $[4,7]$

***Q.6 (10 points)*:** Use an appropriate method to find the volume of the solid generated by revolving the region enclosed by $x = y^2$ and $x = y + 2$ about:

a) $x - axis$

b) $y - axis$

Q.7 (9 points): Determine the surface area of the solid obtained by revolving $x = \sqrt[3]{y}$, $1 \le y \le 8$ about the $x-axis$.

Q.8 (4 points): Find a vertical line $x = k$ that divides the area enclosed by $x = \sqrt{y}$ $x = 2,$ and $y = 0$ into two equal parts.