Prince Sultan University

Department o f Mathematical Sciences

Major II Exam

Semester II, 2007 SPRING (062)

18th April, 2007

MATH 113 – CALCULUS II

Time Allowed : 90 minutes **Mr. Khaled Naseralla**

Maximum Points: 50 points

Name of the student : _____

ID number : _____

Section : _____

For All The Students:

- **Answer all the questions.**
- **This exam consists of *a total of 6 pages and 7 questions.***
- **Show your working in the space provided for each question.**
- **Show all the key steps of your work.**
- **Scientific, non-programmable calculators are allowed.**

Question	Maximum score	*Your Score*
Q.1	15	
Q.2	5	
Q.3	6	
Q.4	6	
Q.5	5	
Q.6	5	
Q.7	8	
Total	**50**	

Q.1 **: Evaluate the following integrals:** **(3 points each)**

a) $\int_1^4 \frac{1}{\sqrt{x}\left(1+\sqrt{x}\right)}dx$

b) $\int \frac{e^{2t}}{\sqrt{e^{2t}-4}}dt$

c) $\int \frac{\sin(\ln x^3)}{x}dx$

d) $\int_0^1 \frac{e^x - 1}{e^{2x}} dx$

e) $\int \frac{x}{1 + x \tan x} dx$

Q.2: **Find the area of the region bounded by** $y = 2x - 2$ **and** $x = \frac{1}{2} y^2$ **(5 points)**

Q.3: **Find the arc length of the graph of** $f(x) = x^{\frac{3}{2}} + 1$ **for** $0 \le x \le \frac{4}{3}$ **(6 points)**

Q.4: **Find the area of the surface generated when** $y = \sqrt{1 - x^2}$ **on the interval** $\left[0, \frac{1}{2}\right]$ **(6 points)**

is revolved about $x - axis$

Q.5: **Use *the cylindrical shell method* to find the volume of the solid generated when the region bounded by the graphs of $y = x^2 + 3$ and $x = y - 5$ is revolved around $y - axis$** **(5 points)**

Q.6: **Use *the washers method* to find the volume of the solid generated when the region bounded by $y = 4\sqrt{x}$, $y = 4$, $x = 4$ and $x = 9$ is revolved about $x - axis$** **(5 points)**

Q.7: **Let R be the region between the graphs $y = 2x$ and $y = x^2$** **(8 points)**

Find the volume of the solid generated by revolving R about:

a) $x - axis$

b) the line $x = -2$