

# **Prince Sultan University**

### Department of Mathematical Sciences

#### **Major II Exam**

Semester II, 2007 SPRING (062) 18<sup>th</sup> April, 2007

### MATH 113 - CALCULUS II

Time Allowed : 90 minutes Mr. Khaled Naseralla Maximum Points: 50 points

Name of the st	udent :	 
ID number	:	
Section	:	

#### For All The Students:

- Answer all the questions.
- This exam consists of <u>a total of</u> <u>6 pages and 7 questions.</u>
- 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	

## $\underline{\textit{Q.1}}$ : Evaluate the following integrals:

(3 points each)

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

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

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

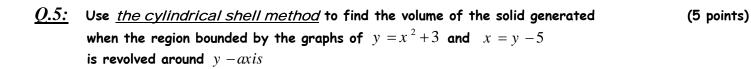
**d)** 
$$\int_{0}^{1} \frac{e^{x} - 1}{e^{2x}} dx$$

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

**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



<u>Q.6:</u> Use <u>the washers method</u> 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

- **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