Prince Sultan University

Math 113
Major Exam 2
Second Semester, Term 142
Saturday, April 11, 2015

Time Allowed: 90 minutes

Student Name:_____ _____ _____

Student ID #: _____

Serial Class #:_____ Section #:

Instructor's Name: Dr. Aiman Mukheimer, Dr. Bahaaeldin Abdalla, Dr. Saleem

Important Instructions:

1. You may use a scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. Talking during the examination is NOT allowed.
5. Your exam will be taken immediately if your mobile phone is seen or heard.
6. Looking around or making an attempt to cheat will result in your exam being cancelled.
7. This examination has 6 problems, some with several parts. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1	10	
2	10	
3,4	10	
5,6	10	
Total	40	

1. (10 points) Evaluate the following integrals: **(Show your work in details)**

i. (4 points) $\int x \tan^2 x \, dx$

ii. (6 points) $\int \frac{1}{\sqrt{x^2 + 2x}} dx$

2. (10 points) Evaluate the following integrals: **(Show your work in details)**

i. (4 points) $\int \cos^2 x \tan^3 x \, dx$

ii. (6 points) $\int \frac{x^2 - 5x + 16}{(2x+1)(x-2)^2} dx$

3. (6 points) Determine whether the integral converges or diverges. Find the value of the integral if it converges:

i. $\int_0^4 \frac{2}{(x-2)^3}\,dx$

4. (4 points) Use a comparison test to determine whether the integral $\int_1^\infty \frac{x}{x^3+e^x}\,dx$ is convergent or divergent.

5. (5 points) Evaluate the following integrals: **(Show your work in details)**

$$\int_0^1 (1+\sqrt{x})^4\, dx$$

6. (5 points) Find the length of the arc of the curve $x = \frac{y^4}{8} + \frac{1}{4y^2},\ 1 \le y \le 2$.