Prince Sultan University

Math 113
Major Exam 2
First Semester, Term 121
Monday, December 3, 2012

Time Allowed: 90 minutes

Student Name:
Student ID #:
Serial Class #:
Instructor's Name:

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 5 problems, some with several parts. Make sure your paper has all these problems.

Problems	Max points	Student's Points
1	30	
2	20	
3	20	
4	20	
5	10	
Total	100	

1. (30 points) Evaluate the following integrals:

a) $\int \frac{x^3}{1+x^8}\,dx$

b) $\int e^x \cos x \;\; dx$

c) $\int \sqrt{\cos x}\, \sin^5 x \;\; dx$

2. (20 points) Evaluate the following integrals:

d) $\int_0^4 e^{\sqrt{x}}\,dx$

e) $\int \frac{x}{\sqrt{7+6x-x^2}}\,dx$

3. (20 points) Evaluate the following integrals:

f) $\int \tan^3 x \sec^3 x \ dx$

g) $\int \frac{x^2+1}{x^2-5x-6} \, dx$

4. (20 points) Determine whether the integral converges or diverges. Find the value of the integral if it converges:

a) $\int_0^2 \frac{x}{\sqrt{x^2-1}}dx$

b) $\int_0^\infty xe^{-x^2}dx$

5. (10 points) Use a comparison test to determine whether the integral converges or diverges: $\int_1^\infty e^{-x^3}\,dx$