**Lebanese American University – Byblos Fall 2012**

**Calculus III – Final Exam Date:** 25/01/2013

**Name : Duration:** 2h 15

1. (5 points) Evaluate the integral 
2. (20 points) Study the convergence of these improper integrals without calculating them, then find their values when they converge:
3. 
4. 
5. (6 points) Determine if the series  converges or not.
6. (20 points) Determine if each of the following series are absolutely convergent, conditionally convergent or divergent.
7. 
8. 
9. 
10. (10 points) Find the interval of convergence and the radius of convergence of the power series 
11. (9 points) Use Maclaurin series to estimate  with an error of magnitude less than
12. (10 points) Let 

Determine if the limit of as exists or not.

1. (10 points) Find the volume under the parabolic cylinder  whose base is the region enclosed by the parabola  and the line in the -plane.
2. (8 points) Find the double integral 
3. (12 points) Find the double integral  where is the region inside the circle  satisfying and 