Philadelphia University
Department of Basic Sciences and Mathematics

Second Exam **Calculus 2 (A)** **7-5-2015**

Student name:_____ **Number:_____** **Section:_____**

A) (points) Write the symbol of the correct answer in the table below.

1	2	3	4	5	6	7

1) The sequence $\left\{\frac{2}{n!}\right\}$

a) diverges b) converges to 0. c) converges to $\ln 2$. d) converges to e^2 e) converges to 2

2) If $a_1 = 1$ and $a_{n+1} = \sqrt{6 + a_n}$, then (a_n) converges to

a) -2 b) 3 c) 4 d) 5 e) 6

3) The sum of the series $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \cdots$ is

a) $\frac{3}{2}$ b) $\frac{4}{3}$ c) $\frac{5}{4}$ d) $\frac{6}{5}$ e) 2

4) $\sum_0^\infty \frac{1}{n+1} - \frac{1}{n+2} =$

a) 1 b) $\frac{1}{3}$ c) $\frac{3}{2}$ d) $\frac{1}{2}$ e) $-\infty$

5) Which of the three series below converges?

1) $\sum \frac{1}{n}$ 2) $\sum \frac{1}{n^{1.3}}$ 3) $\sum \frac{1}{n^{0.9}}$

a) 2 only b) 1 and 2. C) 2 and 3 d) 1 and 3 e) 3 only.

6) The improper integral $\int_0^\infty \frac{1}{1+x^2}\,dx$

a) Converge and equal $\frac{\pi}{2}$ b) Converge and equal $\frac{\pi}{4}$ c) Converge and equal 0 d) diverge

7) $\int_0^2 \frac{dx}{(x-1)^3}$

a) 0 b) 1 c) 2 d) -2 e) diverges

B) Determine whether the following sequence converges or diverges. If it converges, find the limit

$$\left\{\frac{\ln(2+e^n)}{3n}\right\}$$

C) Determine whether the following series converges or diverges. If it converges, find the sum

a) $\sum_{n=1}^{\infty} \frac{(-2)^{n+2}}{5^{n-1}}$

b) $\sum_{n=0}^{\infty} \frac{3^n+4^n}{4^n+2^n}$

D) Find all values of x for which the series converges, and find the sum of the series for those values of x

$$\frac{1}{x^2}+\frac{2}{x^3}+\frac{4}{x^4}+\frac{8}{x^5}+\cdots$$

E) Use the integral test to determine whether the series converges or diverges

$$\sum_{n=0}^{\infty} \frac{\tan^{-1} n}{n^2+1}$$

$$\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$$