MATHEMATICS 201 FIRST SEMESTER, 1999-2000 QUIZ 1

Time: 55 Minutes.

Date: November 13, 1999.

Name:------

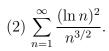
ID Number:------

Circle Instructor's Name: Prof. H. Abu-Khuzam, Prof. A. Lyzzaik

<u>GRADE:</u>	
PART 1.	/64
PART 2.	/36
Total:	/100

PART 1: Investigate for convergence or divergence the following series:

(1)
$$\sum_{n=1}^{\infty} \left(\frac{3n}{3n+1}\right)^n$$
. (9 points)



(9 points)

2

www.amal-aub.org

(3)
$$\sum_{n=2}^{\infty} \sin(1/\ln n).$$
 (9 points)

(9 points)

(4)
$$\sum_{n=1}^{\infty} \frac{(n+2)!}{3^n (n!)^2}.$$

www.amal-aub.org

(5)
$$\sum_{n=1}^{\infty} \frac{1}{[\ln^2(1/n)]^n}.$$

(9 points)

6. Given the power series
$$\sum_{n=2}^{\infty} \frac{(-1)^n n!}{1.4.7.\cdots(3n-2)} x^n.$$
(a) Find the series radius and interval of convergence. (15 points)

(b) For what values of x the series (i) converges conditionally and (ii) absolutely. (4 points)

PART 2: Circle the correct answer in the following multiplechoice questions: (9 points for each question)

7. The sum of the series

$$\sum_{n=2}^{\infty} \left[\frac{1}{n-1} - \frac{1}{n+1}\right]$$

is

- (a) 5/4. (b) 3/2.
- (c) 1.
- (d) 7/4.
- (e) None of the above.

8. The series whose *n*th term is $\frac{\cos n\pi}{n^{0.01}}$

- (a) converges absolutely.
- (b) converges conditionally.
- (c) the series is not alternating.
- (d) diverges.
- (e) None of the above.

9. The best magnitude of the error involved in using the sum of the first four terms to approximate the sum of the entire series

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

is less than

- (a) 0.04.
- (b) 0.03.
- (c) 0.02.
- (d) 0.01.
- (e) None of the above.

10. Which of the following statements is **FALSE**?:

(a) If $\sum a_n$ and $\sum b_n$ are both convergent, then $\sum (a_n + b_n)$ is convergent.

(b) If $\sum a_n$ is convergent and $\sum b_n$ is divergent, then $\sum (a_n + b_n)$ is divergent.

(c) If $\sum a_n$ converges, then $\lim_{n\to\infty} a_n = 0$.

(d) If $\sum a_n$ and $\sum b_n$ are both divergent, then $\sum (a_n + b_n)$ is divergent.

(e) None of the above.