Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 102- Q4 Date: 2-1-20010

Show all your work. No credits for answers not supported by work

1. Determine whether the series converges or diverges. State the name of the test you use.

(a) $\sum_{n=1}^{\infty} \frac{n!+n}{(n+1)!}$

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

(c) $\sum_{n=1}^{\infty} \frac{5^n}{3^n+2\times 4^n}$

2. Find all values of k for which the series is convergent. $\sum_{n=2}^{\infty} \frac{(\ln n)^k}{n}$

3. Estimate the error in using the partial sum S_{10} to approximate the sum of the series $\sum_{n=2}^{\infty} \frac{1}{k^4}$.

4. Show that the following series is convergent. How many terms are needed for S_n to approximate the sum of the series to within 3 decimal places. $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{(2n+1)!}$