Calculus III, MAT 2213-5
Examination, March 10,1994
Instructor: D. Gokhman

Name: _____

1. (30 pts.) Determine whether the following series converge:

$$\text{(a)} \sum_{k=1}^{\infty} \frac{\log(k)}{\sqrt{k}} \qquad \text{(b)} \sum_{k=1}^{\infty} \frac{(k!)^3}{(3k)!} \qquad \text{(c)} \sum_{k=1}^{\infty} \left(\frac{k}{k+1}\right)^{k^2}$$

2. (20 pts.) Find the interval of convergence of

$$\sum_{k=1}^{\infty} \frac{(-1)^k}{\sqrt{k+2}} (3x+2)^k$$

3. (30 pts.) Find the second order Taylor approximation for $-\log(2-x)$ at 1. Estimate the absolute error on $[1/2, 3/2]$.

4. (20 pts.)   Find the first four nontrivial terms of the Maclaurin series for the following functions:

$$\text{(a)} \; f(x) = \frac{x^9}{(2-x)^2} \qquad \text{(b)} \; f(x) = x^4 (x-1) e^{x^3}$$

Extra credit (5 pts.): What would they be for e^{x^3+1}?

1	2	3	4	5	total (100)