Problem 1. Use the Comparison Test to determine whether the following series are convergent or divergent.

a. $\sum_{n=1}^{\infty} \frac{n}{2n^3+1}$

b. $\sum_{n=1}^{\infty} \frac{9^n}{3+10^n}$

c. $\sum_{n=1}^{\infty} \frac{n!}{n^n}$

d. $\sum_{n=1}^{\infty} \frac{e^{\frac{1}{n}}}{n}$

Problem 2. Use the Alternating Series Test to determine whether the following series are convergent or divergent..

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

b. $\sum_{n=1}^{\infty} \frac{(-1)^n n^n}{n!}$

c. $\sum_{n=1}^{\infty} (-1)^n \cos(\pi/n)$

d. $\sum_{n=1}^{\infty} (-1)^n e^{-n}$

Problem 3. Use the Ration and the Root Tests to determine whether the following series are absolutely convergent, conditional convergent or divergent..

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

b. $\sum_{n=1}^{\infty} \frac{n^{10}}{(-10)^{n+1}}$

c. $\sum_{n=1}^{\infty} \frac{n!}{100^n}$

d. $\sum_{n=0}^{\infty} \frac{(-3)^n}{(2n+1)!}$