1) (a) (1 point) Give the definition of a sequence
(b) (1 point) Give the definition of a series
(c) (2 points) Give the definition of a conditionally convergent series and give an example of a series that is conditionally convergent
(c) (4 points) State the Alternating Series Test

Determine whether each of the following series converges or diverges.

2) (3 points) \[ \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n^2 + 3} \]

3) (5 points) \[ \sum_{n=1}^{\infty} \frac{n^6}{2^n} \]

4) (3 points) \[ \sum_{n=1}^{\infty} \frac{(-1)^n 2n^2}{5n^2 + n} \]

5) (3 points) \[ \sum_{n=1}^{\infty} \frac{(-1)^{n-1} n^2}{3n^5 + 2} \]

6) (5 points) \[ \sum_{n=1}^{\infty} \frac{7n^3}{n!} \]

7) (5 points) \[ \sum_{n=1}^{\infty} \frac{9n!}{n^{10} 15^n} \]