



# COMSATS University Islamabad

## Attock Campus

### Department of Mathematics

#### Assignment # 02

**Class:** BSM-V

**Subject:** Real Analysis I

**Instructor:** Dr. Atiq ur Rehman

**Due Date:** 27-10-2022 (11:30AM)

**Course Code:** MTH321

**Marks:** 10

**Note:** Please follow the due date & time strictly.

Student must submit the hard copy of the assignment during office time.

**Q 1:** Prove that  $\left\{ \frac{n+3}{n+2} \right\}$  is monotone sequence.

**Q 2:** Use definition of the limit to prove that  $\left\{ \frac{1}{2^n} \right\}$  converges to '0'.

**Q 3:** Give an example of unbounded sequence which has convergent subsequence.

**Q 4:** Prove that  $\{5^n\}$  diverges to  $\infty$ .

**Q 5:** Prove that if  $\lim_{n \rightarrow \infty} s_n = t$ , then  $\lim_{n \rightarrow \infty} |s_n| = |t|$  but converse is not true in general.

#### Academic Honesty Requirements:

You are encouraged to work with others in the completion of assignments, but it doesn't include copying. However, in the spirit of Academic Honesty, which includes crediting others for their contribution to your work, please include one of the following statements with every submitted assignment on title page:

1. I worked alone on this assignment.
2. I worked with the following: List their full names. Include their relationship to you if they are not also a member of this class.