



COMSATS University Islamabad

Attock Campus

Department of Mathematics

Assignment # 02

Class: BSM-V
Subject: Real Analysis I
Instructor: Dr. Atiq ur Rehman

Due Date: 13-04-2023 (12:00PM)
Course Code: MTH321
Marks: 9

Note: Please follow the due date & time strictly.
Students must submit a hard copy of the assignment during office time.
Write the solution to any three of the questions given below.

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 ∞ .

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.

Q 6: If the sequence $\{s_n\}$ converges to s , where $s \neq 0$, then there exists a positive integer n_1 such that $|s_n| > \frac{1}{10}|s|$ for all $n > n_1$.

Academic Honesty Requirements:

You are encouraged to work with others in the completion of assignments, but it doesn't include copying. Academic integrity is an ethical code, whereby the student guarantees that all work submitted is the student's own work. For this purpose, please include the following statement with every submitted assignment on title page:

I worked on this homework myself, and I understand it.