# COMSATS University Islamabad

Attock Campus

## Department of Mathematics

**Assignment # 04**

**Class:** MSc-I
**Subject:** Real Analysis I
**Instructor:** Dr. Atiq ur Rehman

**Due Date:** 14-12-2018
**Course Code:** MTH321
**Marks:** 05

**Notes:**

- Students with odd registration number will solve Q # 1 and 3.
- Students with even registration number will solve Q # 2 and 4.

**Question # 1:**

Prove that if a sequence $\{s_n\}$ has two convergent subsequences, whose limits are not equal, then $\{s_n\}$ is divergent.

**Question # 2:**

If $\sum a_n$ with $a_n > 0$ is convergent, then is $\sum a_n^2$ always convergent? Either prove it or give a counter-example.

**Question # 3:**

Prove that $\sum_{n=0}^{\infty} \frac{1}{(n+1)(n+2)} = 1.$

**Question # 4:**

If $\sum a_n$ and $\sum b_n$ are convergent, then show that $\sum (a_n + b_n)$ is convergent.

**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.