



COMSATS University Islamabad

Attock Campus

Department of Mathematics

Assignment # 01

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

Due Date: 02-11-2020
Course Code: MTH322
Marks: 10

Instructions:

- Please name the PDF as **a1-mth322-xyz**, where xyz is last three digits of your registration number (e.g. if your registration number is **sp20-mmt-071**, then name the as **a1-mth322-071**) before submission.
- Similarity of a solution with other students may reduce your marks.
- Please make sure that the PDF is good before sending.
- Email PDF at atiq+mth322@cuiatk.edu.pk (any email address can be used for sending).

Question # 1

Suppose $f(x)$ and $g(x)$ are positive integrable functions for $x > a$. If

$\lim_{x \rightarrow \infty} \frac{f(x)}{g(x)} = \infty$, then convergence of $\int_a^\infty f(x)dx$ implies convergence of $\int_a^\infty g(x)dx$.

Question # 2

Prove that $\lim_{x \rightarrow \infty} \frac{x^p}{e^x} = 0$, where $p \in \mathbb{R}$.

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.