

**DEPARTMENT OF MATHEMATICS**  
**COMSATS University Islamabad, Attock Campus**

**Quiz # 1 (Solve on one page)**

**Class:** MSc: Sem. III

**Max. Marks:** 10

**Course Title:** Convex Analysis

**Course Code:** MTH424

**Instructor:** Dr. Atiq ur Rehman

**Due Date:** 6-11-2020 (1500 hrs)

**Instructions:**

- Please name the PDF as **q1-mth424-xyz**, where *xyz* is last three digits of your registration number (e.g. if your registration number is fa19-mmt-041, then name file as q1-mth424-041) before submission.
- Similarity of a solution with other students may reduce your marks.
- Please make sure that the PDF is good before sending and email at [atiq+mth424@cuiatk.edu.pk](mailto:atiq+mth424@cuiatk.edu.pk)
- Please send the solution by email only one time (don't send multiple emails). If you have problem sending email, then you may send by WhatsApp but with proper file name.

**Question 1:** For what value of  $p$ , the function  $e^{px}$  is strictly convex on  $\mathbb{R}$ .

**Question 2:** Use second derivative test to prove that  $F(x) := \int_a^x f(t)dt$  is convex on  $[a, b]$ , if  $f$  is differentiable and increasing on  $[a, b]$ .



**Course page:** [www.mathcity.org/atiq/fa20-mth424](http://www.mathcity.org/atiq/fa20-mth424)