BRAC UNIVERSITY

Inspiring Excellence

MAT 215

Fall 2020

Assignment 01

SET: A

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*Please write your name and ID on the assignment script. The deadline for submitting the assignment is **27th October 2020**. Solve **all the problems**. You will receive 5 bonus marks for **submitting your assignment in LaTeX**. **No Late submissions will be accepted**.*

Any information you need to solve this exam are given in the question.

*Be creative, use your intuition. Answer the questions by yourself. Cheating and Copying will lead to **50%** deduction from your total marks in the course and a Zero in the assignment. **Total marks is 50**. Each question carries 10 marks.*

Remember students for all intents and purposes in the questions below whenever you see the letter 'i' in any of the questions, it represents the following equality $i = \sqrt{-1}$.

1. Use the help of the polar representations of complex numbers to express $(1+i)^3$ in the form $a + bi$, where a and b are real.
2. Express $e^{2+i\pi 2}$ in the $a + bi$ form.
3. Express $\dfrac{1}{1+i} + \dfrac{2}{3+2i}$ in the $a + bi$
4. Find the distinct roots of z for the following equation, $z^4 = 3i$.
5. Prove by taking $z = a + bi$, $z - \bar{z} = 2iIm\ z$.