Roll No:

Date:

Formative assessment 6
ME-781, Aug 25, 2023

Max Marks: 10, Total time: 15 minutes

- No explanation for any question would be provided.
- Please make any assumptions as you see fit and solve the questions.
- This is an open-notes exam.
- You need not derive anything from scratch if it was derived in the class.
- You are not allowed to use a computer or calculator.

4+2x3

1. Let x be a random variables with uniform distribution in [0, 1]. Find value of
    a. Derive the characteristics function for the random variable x.

    b. If we take a sample of 15 data points form the above random distribution, then what is the expected value of
        i. Sample mean

        ii. Variance of sample mean

        iii. Do we need to use Central Limit Theorem (CLT) for above two calculations. If yes, then explain where did we use it; if no then explain what additional information we get from using CLT