

ECE302F Lecture Group 04 Quiz 4

Rules:

- No books or aid sheets of any sort allowed;
 - Non-programmable electronic calculators CAN be used;
 - Total duration of quiz: 30 minutes;
 - Answer all questions.
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1. The random variable X is the total access time (waiting time + read time) to get one block of information from a computer disk. X is uniformly distributed between 0 and 12 milliseconds. Before performing a certain task, the computer must access 12 different blocks of information from the disk. (Access times for different blocks are independent.) The total access time for all 12 blocks of information is A milliseconds.

- (a) What is $E[X]$? (1 mark)
- (b) What is $\text{var}(X)$? (2 marks)
- (c) What is $E[A]$? (1 mark)
- (d) What is σ_A , the standard deviation of A ? (2 marks)
- (e) Use the central limit theorem to estimate $P[A > 75]$, the probability that the total access time exceeds 75 milliseconds. (2 marks)
- (f) Use the central limit theorem to estimate $P[A < 48]$, the probability that the total access time is less than 48 milliseconds. (2 marks)

For the last two parts, use the Q function table provided.