Quiz 3 MATH 3280 3.00 Sept 30, 2020

Given name and surname:_____

Student No:_____

Signature:_____

INSTRUCTIONS:

1. Please write everything in **ink**.
2. This quiz is a 'closed book' test, duration **20** minutes.
3. Only non-programmable calculators are permitted.
4. The text has two pages, and it contains two questions. Read the question carefully. Fill in answers in designated spaces. Your work must justify the answer you give. Answers without supporting work will **not** be given credit.

USEFUL FORMULAS:

For $x \geq 0,\ t \in [0,\ 1)$ and $k = 0,\ 1,\ 2,\ \ldots$, if the uniform distribution of deaths (UDD) assumption holds for the life-status (x), then the following is true

$$ {}_{t+k}p_x \approx (1-t)\,{}_kp_x + t\,{}_{k+1}p_x. $$

GOOD LUCK!

Question 1 Recall that the last survivor life status $(\overline{x:\overline{n}|})$, $x \geq 0$, $n \in \mathbb{N}$ dies upon the latest of the deaths of the two life statuses (x) and $(\overline{n}|)$. Assume that the UDD assumption (see the list of useful expressions) holds for the life status (x), does this imply that the UDD approximation holds for the last survivor life status, too? Prove or disprove.

Question 2 Assume that the random variable (RV) $T(x)$, $x \geq 0$ is distributed exponentially with the rate parameter $\mu \in \mathbb{R}_+$. What is the distribution of the RV $T(x+t)$, $t \in \mathbb{R}_+$? What is $\mathring{e}_{x+t}$?

The End.