Quiz 1 MATH 3280 3.00 Sept 15, 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.

GOOD LUCK!

Question 1 Let the random variables (RVs) $N \in \mathbb{N}$ and $M \in \mathbb{N}$ denote the number of claims submitted to a life insurer in April and May, , respectively. . The joint probability mass function (PMF) of the two RVs is given by

$$p(n,m) = \begin{cases} \frac{3}{4}\left(\frac{1}{4}\right)^{n-1} e^{-n}\left(1-e^{-n}\right)^{m-1}, & n,m = 1,\ 2,\ \ldots \\ 0, & \text{otherwise} \end{cases}$$

Compute the expected number of claims that the insurer is going to get in May, given that exactly 2 claims were submitted in April.

Question 2 Let the RV $T(x),\ x \in \mathbb{R}_+ \cup \{0\}$ be distributed exponentially with $\mathbb{E}[T(x)] = 3$. Compute $\mathbb{E}[T(\overline{x:\bar{2}})]$. (Recall that the last survivor life status $(\overline{x:y}),\ x,y \in \mathbb{R}_+ \cup \{0\}$ dies upon the last death of (x) and (y).

The End.