

Name:  
Roll Number:  
Department:  
Program: BTech / MTech TA / MTech RA / PhD (Tick one)



## AI5030: PROBABILITY AND STOCHASTIC PROCESSES

### QUIZ 6

DATE: 18 NOVEMBER 2024

Question	1	2	Total
Marks Scored			

#### Instructions:

- Fill in your name and roll number on each of the pages.
- You may use any result covered in class directly without proving it.
- Unless explicitly stated in the question, DO NOT use any result from the homework without proof.

Fix a probability space  $(\Omega, \mathcal{F}, \mathbb{P})$ .

Assume that all random variables appearing in the questions below are defined with respect to  $\mathcal{F}$ .

#### 1. (2 Marks)

Let  $U \sim \text{Unif}(0, 2)$ . Compute  $\mathbb{E}[U | \{U > 1\}]$ .

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**2. (3 Marks)**

Let  $X$  and  $Y$  have the joint PDF

$$f_{X,Y}(x,y) = \begin{cases} 3y, & -1 \leq x \leq 1, 0 \leq y \leq |x|, \\ 0, & \text{otherwise.} \end{cases}$$

Determine  $\mathbb{E}[X|Y]$  and  $\mathbb{E}[X^2|Y]$ .