EXAM FOR PROBABILITY & STATISTICS (6PAS1)
WINTER SEMESTER 2025/2026

QUESTIONS SET NO. 2

1. Define covariance between two random variables. Write and prove an alternative formula for covariance which is easier for computations.

2. Three players play a game of throwing a coin. Those who get more heads, wins. Each player throws up to three times, but the first player is a big pessimist: if at the first throw he get tail, he stops throwing. The other player is also a pessimist, but a lesser one: he stops throwing if he get tail in the first two throws. The third player never stops prematurely: he always throws a coin three times. Let X, Y and Z be random variables, equal to how many heads got the first, the second, and the third player, respectively. Determine:
a) $E[X]$
b) $E[Y]$
c) $E[Z]$
d) $P(X < Y)$.