Total Marks: 10   **Time Duration:** 45 minutes

Question 1   (3 marks)

If an integer is randomly selected from all positive 2-digit integers, what is the probability that the integer chosen has

(a) [1 mark] a 4 in the tens place?

(b) [1 mark] at least one 4 in the tens place or the units place?

(c) [1 mark] no 4 in either place?

Question 2   (2 marks)

A certain company places a six-symbol code on each of their products. The first two symbols are one of the letters A–E and the last four symbols are digits. If repeats are allowed on both letters and numbers, how many such codes are possible?

Question 3   (5 marks)

Consider two games. In game I a fair die is rolled and a player wins the dollar amount of the score obtained. In game II the same die is rolled, but the player wins \$3 if a score of 1, 2, or 3 is obtained and wins \$4 if a score of 4, 5, or 6 is obtained. Let X and Y be the score earned from game I and II respectively.

(a) [1 mark] Determine the PMF of X and Y.

(b) [3 marks] Compute $E[X]$, $E[X^2]$ and hence $Var[X]$, then do the same for Y.

(c) [1 mark] Compare the variability of both the games.