

Question 1**(9 marks)**

A bag contains 1 red marble and 4 green marbles. A single marble is drawn from the bag. The random variable Y is defined as the number of green marbles drawn from the bag.

- (a) Complete the probability distribution for Y shown below. (2 marks)

y	0	1
$P(Y = y)$		

- (b) State the distribution of Y . (1 mark)

- (c) Determine the mean and standard deviation of the distribution. (2 marks)

The above process is repeated five times, with the marble being replaced every time. The random variable X is defined as the number of green marbles drawn from the bag in five attempts.

- (d) State the distribution of X , including its parameters. (2 marks)

- (e) Evaluate the probability of selecting exactly two green marbles. (2 marks)