**Probability Exercises:**

**Section 1:**

Q1. There are 20 PC’s in P1160, three of which are not working. If two students enter the lab together what is the chance that they both select a faulty PC to work at?

Q2. If you roll two dice what is the probability that they are both even?

Q3. If you roll a die what is the probability that you get a two OR a number greater than four?

Q4. If you roll a die what is the probability that you get a two OR an EVEN face?

Q5. If you select a card from a shuffled deck it’s a QUEEN OR a DIAMOND?

**Section 2:**

**Question 1.**

A batch of 50 computers contains 7 with faults. If two computers are selected at random without replacement. Calculate the probability that

1. Both are defective
2. Neither are defective
3. Exactly one of the two computers has a fault
4. At least one of the two computers has a fault.

**Question 2.**

Suppose you draw three cards at random and without replacement from a shuffled deck. Calculate the probability that

1. all three cards are aces
2. the first card is a jack, the second a queen and the third a king.

**Question 3.**

This time you only draw one card from a deck and then replace the card and shuffle. If you do this three times has your likelihood of getting three aces increased, decreased or stayed the same.

**Section 3:**

***Question 1.***

It is estimated that 50% of emails are spam emails. Some software has been

applied to filter these spam emails before they reach your inbox. A certain brand of software claims that it can detect 99% of spam emails, and the probability for a false positive (a non-spam email detected as spam) is 5%.

Now if an email is detected as spam, then what is the probability that it is in fact a non-spam email?

**Question 2:**

A company makes Bluetooth headphones. One out of every 60 gadgets is faulty, but the company doesn't know which ones are faulty until a buyer complains. Suppose the company makes a €4 profit on the sale of any working headphones, but suffers a loss of €75

for every faulty set of headphones because they have to repair the unit. Check whether the company can expect a profit in the long term.