**PMY8111 Section B Question 1**

**PLEASE STATE YOUR FIVE DIGIT ANONYMOUS CODE:**

(a) Describe the differences between top-down and bottom-up approaches in liposome production, including an example of each approach.

[30%]

(b) Discuss the advantages non-viral vectors have over viral vectors for nucleic acid delivery.

[30%]

(c) Discuss the composition, structure, and nucleic acid release mechanism of the Pfizer BioNTech vaccine for COVID 19 that have led to the positive immune response in humans.

[40%]

Please write your answer between the lines above and below this sentence (you may delete this text)

**Please check you have entered your anonymous code at the top of the first page**

**For staff use only. Do not delete or alter this section in any way**

Marks awarded for this question: