

3. (This complete question is worth 20 marks)

- (i) State the defining characteristics of a *Map* (i.e. a *dictionary* in Python), and state the standard operations offered in the Map ADT. For each operation, give a brief comment explaining what it does.

(6 marks)

- (ii) Explain the concept of a *bucket array*, and outline the basic implementation of a Map using a bucket array.

(5 marks)

- (iii) Explain *Open addressing* and *Linear probing* as a method to implement a Map without requiring a bucket array, yet giving expected constant time complexity for updates and retrieval.

(9 marks)

Total: 80 marks

END OF PAPER