

NATIONAL UNIVERSITY OF SINGAPORE

SCHOOL OF COMPUTING EXAMINATION FOR CS1020

Semester 2: AY2013/2014

CS1020 – Data Structures and Algorithms I ANSWER BOOKLET

May 2014

Time allowed: 2 hours

INSTRUCTIONS TO CANDIDATES

1. This Answer Booklet consists of **TEN (10)** printed pages.
2. Fill in your Matriculation Number clearly below and at the top of pages 3, 5, 7 and 9.
3. The last blank page (page 10) may be used if you need more space to write your answers.
4. You may write your answers in pencil.

MATRICULATION NO.:

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(Write your Matriculation Number above legibly with a pen.)

FOR EXAMINER'S USE ONLY			
Section/Questions	Possible	Marks	Check
A. MCQs 1 – 6	18		
B. Q 7	8		
B. Q 8	12		
B. Q 9	12		
B. Q 10	10		
B. Q 11	9		
B. Q 12	10		
B. Q 13	15		
B. Q 14	6		
Total	100		

MCQs

[18 marks]

Q1. Q2. Q3. Q4. Q5. Q6.

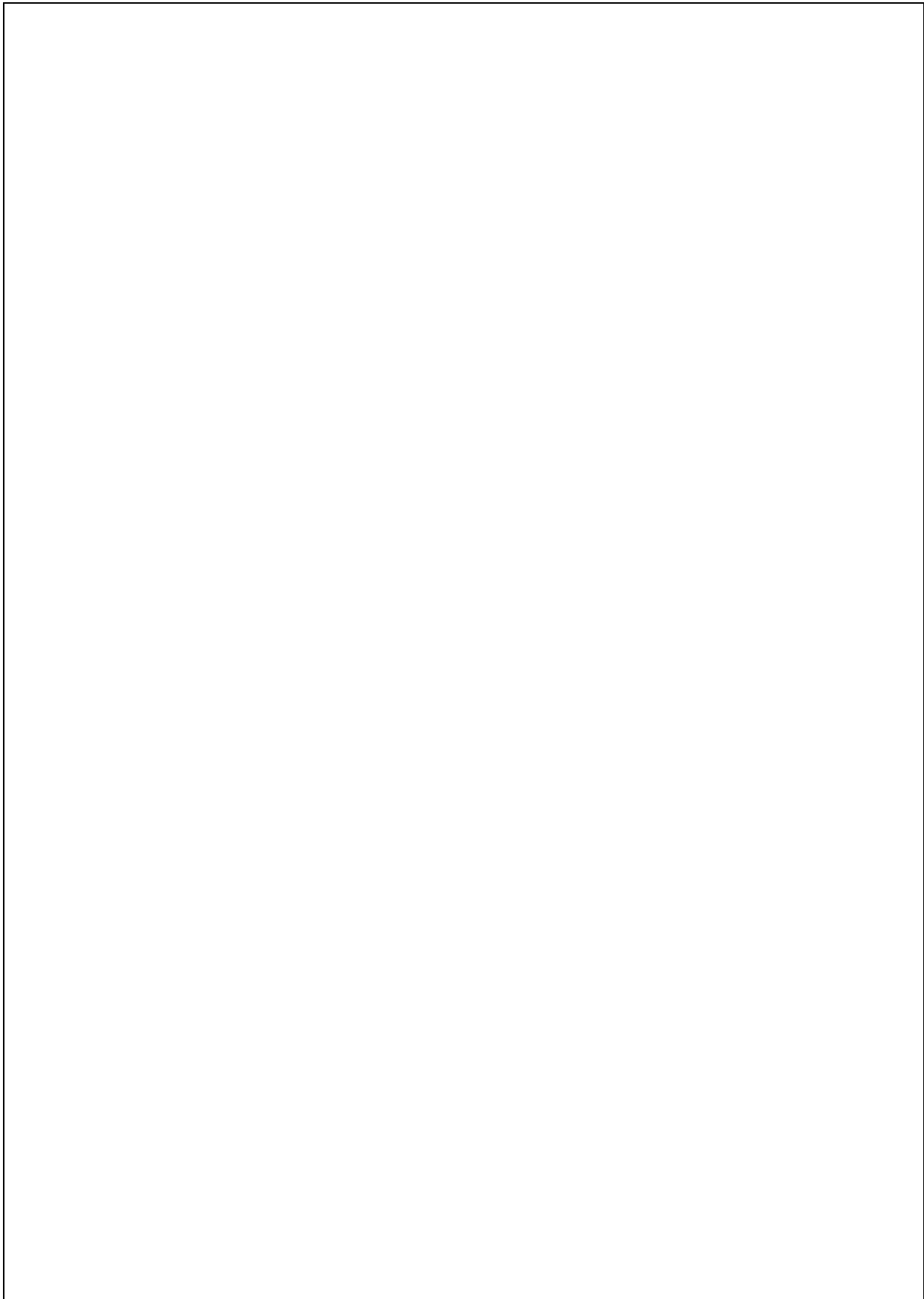
Q7.

[8 marks]

```
public boolean searchAndSwitch(E item) {  
  
    ListNode <E> curr = head;  
    ListNode <E> prev = null;  
    while (curr != null &&  
           !curr.getElement().equals(item)) {  
        prev = curr;  
        curr = curr.getNext();  
    }  
    // Write your code only inside the dashed box below
```

```
return true;  
}
```


Q9.

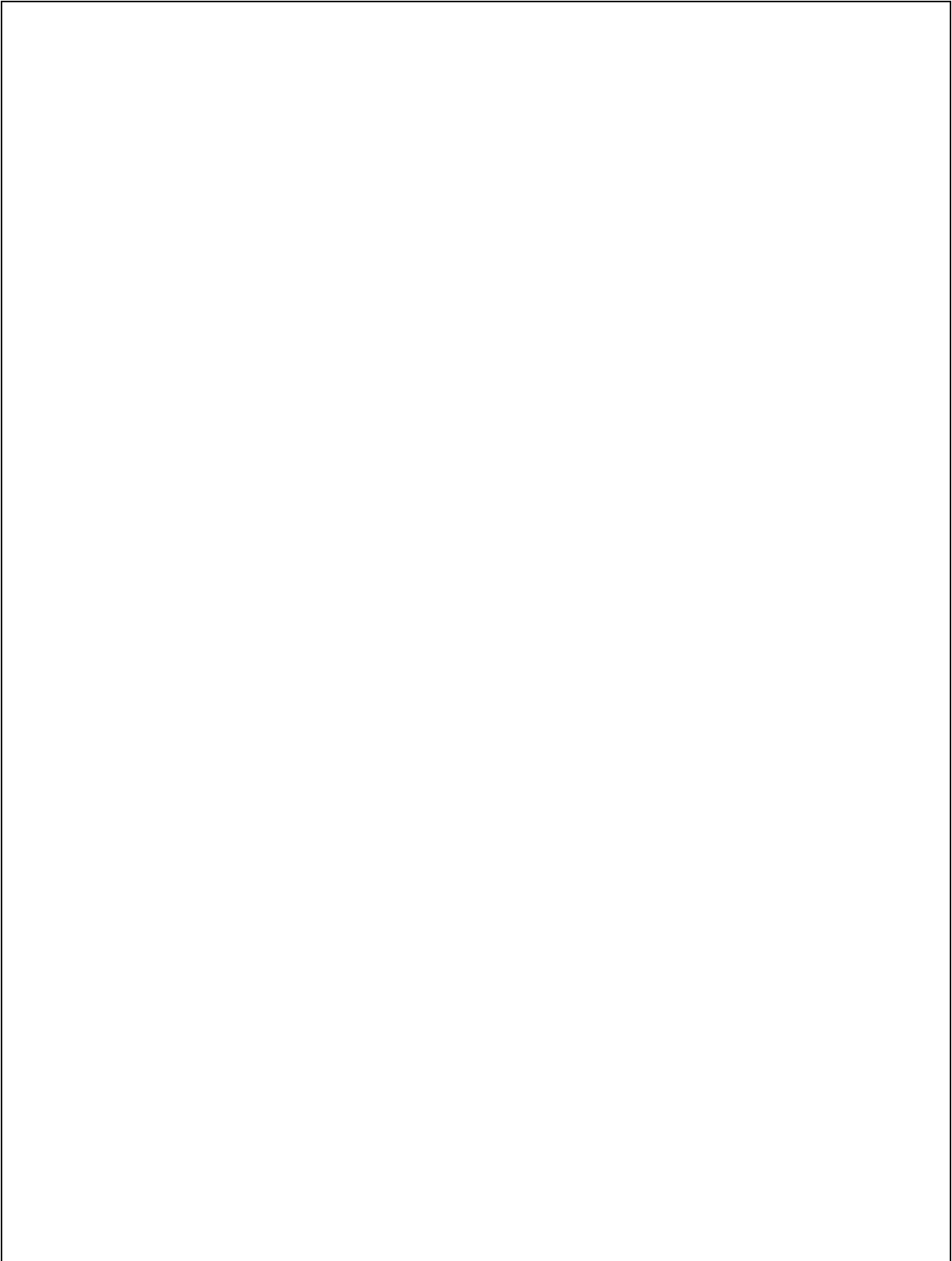


Matriculation no.:

CS1020
[12 marks]

Q9. (continued...)

Q10.



Matriculation no.:

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[9 marks]

Q11.

- (A) Improved Bubble Sort
Number of passes =
Number of comparisons =
- (B) Selection Sort
Number of passes =
Number of comparisons =
- (C) Insertion Sort
Number of passes =
Number of comparisons =

Q12.

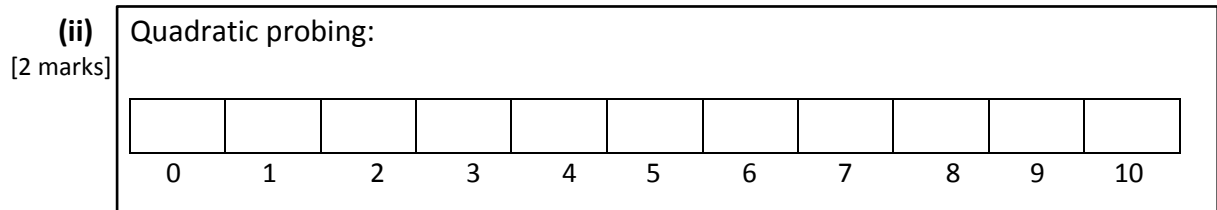
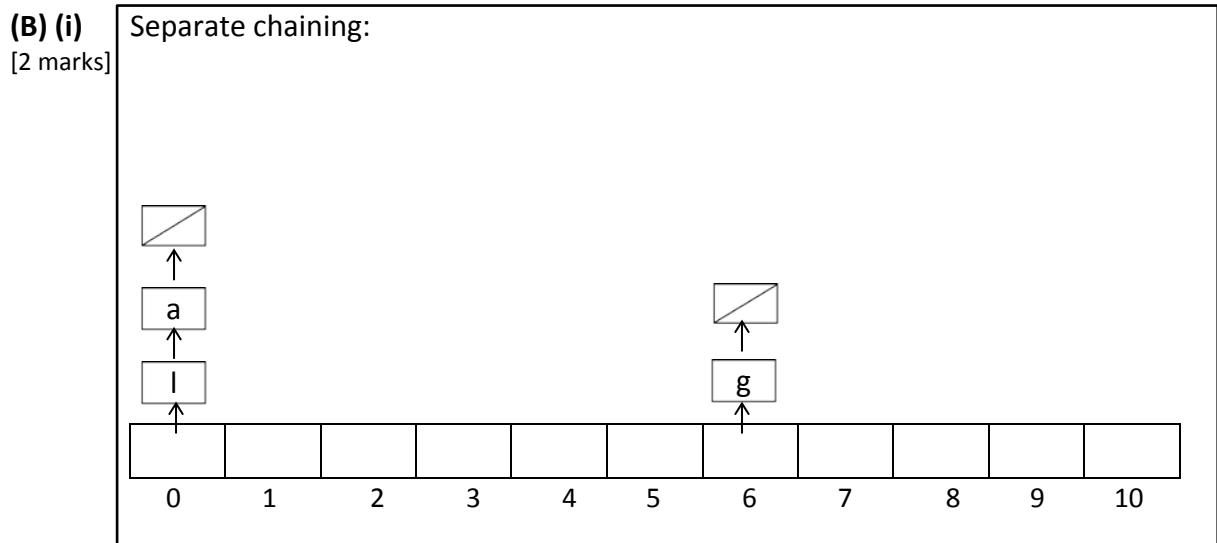
[10 marks]

Q13.

(A) (i) Sequence for inserting the keys:
 [3 marks]

(ii) Keys involved in this insertion:
 [3 marks]

(iii) Probe sequence:
 [3 marks]

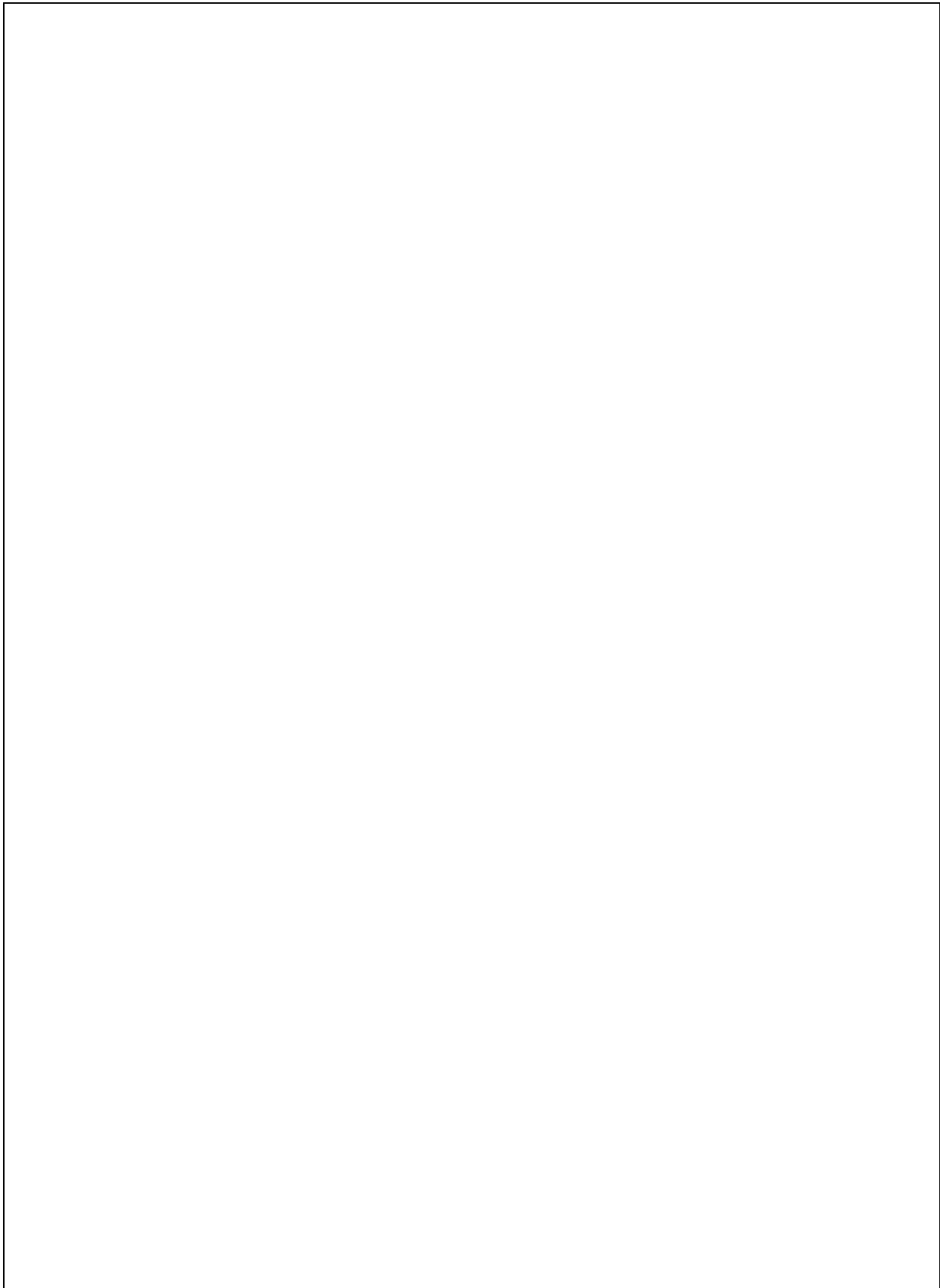


(iii)
 [2 marks]

Matriculation no.:

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[6 marks]

Q14.



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Do **NOT** use it for your rough work.

Use it **ONLY** if you need extra space for your answer, in which case please indicate the **question number clearly**.

A large empty rectangular box with a thin black border, intended for students to write their answers to the questions. The box is completely blank and occupies most of the page's area.

~~~ **END OF PAPER** ~~~