



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

SEMESTER I EXAMINATION – 2012/2013: [SAMPLE SOLUTIONS](#)

COMP 20080

Computer Science for Engineers II

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Mr. J. Dunnion

Prof. L. Murphy*

Time allowed: 2 hours

Instructions for candidates

Answer ALL questions. Question 1 is worth 40 marks. All other questions are worth 3 marks each.

Write your answers in the Answer Books provided.

Instructions for invigilators

Loose Rough Work sheets are not to be distributed or used.

Use of calculators is prohibited.

SAMPLE SOLUTIONS

1. [40 marks]

```
#include "Queue.h"

Queue::Queue()
{
    tail=0;
    head=N;
}

void Queue::enqueue(int item)
{
    if (!isFull())
    {
        items[tail++] = item;
        tail = tail%N;
    }
}

int Queue::dequeue()
{
    if (!isEmpty())
    {
        head = head%N;
        return items[head++];
    }
    return 0;
}

bool Queue::isFull()
{
    // this queue stores up to N-1 integers
    return (head%N == (tail+1)%N);
}

bool Queue::isEmpty()
{
    return (head%N == tail);
}

int Queue::length()
{
    return (N+tail-head)%N;
}
```

SAMPLE SOLUTIONS

2. (b) and (d)

3. False

4. (a) and (c)

5. True

6. (c)

7. (a) and (d)

8. (a)

9. False

10. (b) and (c)

11. (a), (c) and (d)

12. True

13. (b)

14. True

15. (a) and (c)

16. (c) and (d)

17. (c)

18. False

19. (a), (b) and (d)

20. (b)

21. False