Beijing-Dublin International College

SEMESTER 1 FINAL EXAMINATION - (2017/2018)

School of Computer Science

SAMPLE-2006J Operating Systems - Sample Paper

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Time Allowed: 120 minutes

Instructions for Candidates:

Answer succinctly and to the point

BJUT Student ID:_____ **UCD Student ID:**_____

I have read and clearly understand the Examination Rules of both Beijing University of Technology and University College Dublin. I am aware of the Punishment for Violating the Rules of Beijing University of Technology and/or University College Dublin. I hereby promise to abide by the relevant rules and regulations by not giving or receiving any help during the exam. If caught violating the rules, I accept the punishment thereof.

Honesty Pledge:_____ **(Signature)**

Instructions for Invigilators
No rough-work paper is to be provided for candidates.

1. Why do we need *File Management*, when a process can easily store information inside its address space?

2. Briefly describe four computer security threats.

3. Briefly describe four *Page Replacement* algorithms

4. Describe the following architectures and their advantages and disadvantages in relation to each other:

    (a) Monolithic architecture

    (b) Layered architecture

    (c) Microkernel architecture

5. Describe how the following memory management techniques work:

    (a) Paging

    (b) Segmentation

    (c) Fixed Partitioning

    (d) Variable Partitioning

6. What is a *thread*? How is it different from a *process*? Explain the motivation behind its development.

7. What is the *Dining Philosophers* problem? Explain one possible solution to the problem.

8. Why is memory protection important and how is this achieved using *base* and *limit* registers?

9. What is a *child process*? On unix, after a *fork* system call, how do we know if a child is executing or a parent?

10. What are the most important properties of a *real-time* operating system?

11. Why is memory protection important? Explain how it is achieved using a *base* and *limit* register

12. In a virtual memory system, what are the sequence of events that occur when an address is not in main memory?

13. Why do we need *File Management*, when a process can easily store information inside its address space?

14. What are *protected instructions*? Why are they required in an operating system?