

OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER I EXAMINATIONS 2002/2003

Operating Systems (CT 223)

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Time allowed: TWO hours

Answer any 3 questions.

All questions carry equal marks

Q1.

- a. Outline the main types of operating systems, stating aspects of processor scheduling, memory management, I/O management and file management. (15)
- b. What are the functional requirements to be considered by an operating system designer? (10)
- c. What is the execution mechanism of a command in an interactive operating system? (10)

Q2.

- a. What is a process? What is a thread? What is the difference between a process and a program? (10)
- b. What are the possible states of a process? Draw the transition diagram. (15)
- c. What are the typical services offered by an operating system for process management? (10)

Q3.

- a. What are the most common approaches for device management? Draw the diagram that shows a typical device management organization. (10)
- b. Describe direct I/O device management method. Describe direct I/O with polling architecture (10)
- c. Describe interrupt-driven I/O architecture (15)

Q4.

- a. Describe the instruction formats. (10)
- b. What is a stack? Describe implicit and explicit usage models. (10)
- c. Describe at least five addressing modes currently used in the modern processors. (15)

Q5.

- a. Represent number 3.5 using floating point IEEE 745 standard, in single precision format. (10)
- b. Describe (draw) the basic computer organization and describe briefly the subsystem components (buses, CPU, memory and I/O) (15)
- c. Describe the typical CPU organization and its main subsystems (Control Unit ALU) (10)

Q6.

- a. What is a hardware interrupt? What is an interrupt handler? (10)
- b. Describe the process scheduler typical organization and the two main types of schedulers. (10)
- c. Describe time slice (Round Robin) scheduler. (15)