

DUBLIN INSTITUTE OF TECHNOLOGY  
KEVIN STREET, DUBLIN 8.

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## BSc. (Honours) Degree in Computer Science

Year 1

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SEMESTER 1 EXAMINATIONS 2013/2014

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### COMPUTER ARCHITECTURE AND TECHNOLOGY

Art Sloan  
Dr. D. Lillis

Tuesday 7<sup>th</sup> January,                      9.30am – 11.30am

Answer **Question 1** and **any two** questions from the remaining three available.

Question 1 carries 40 marks while  
all further questions each carry 30 marks.

**1. Compulsory**

- (a) Describe the 'stored program concept' associated with von Neumann Architecture. (10 marks)
- (b) Describe the CPU (central processing unit) elements of ALU (arithmetic logic unit) and control unit, and how they relate to the concept of 'instruction set'. (10 marks)
- (c) Outline the sequence of a microprocessor's 'Fetch-Execute Cycle' and include interrupt handling. (10 marks)
- (d) Describe the features of 'multitasking', 'timesharing' and 'threading'. (10 marks)
2. (a) Describe electricity and circuits in relation to their use in computers. (10 marks)
- (b) What is the basis of a computer system design, and what does such a system contain? (10 marks)
- (c) What was the relationship between first generation computer hardware and vacuum tubes? (10 marks)
3. (a) Give an account, in your own words, of the evolution of microprocessors from integrated circuits of the 1950s to multicore processors to today. (10 marks)
- (b) Define magnetic storage and optical storage media, with one example of each. (10 marks)
- (c) Compare parallel and serial bus architectures for a personal computer. (10 marks)
4. (a) Give a definition of a computer network protocol and include the purpose of such a protocol. (10 marks)
- (b) Give examples of the network transmission media of copper cable, fibre optic cable and wireless media. (10 marks)
- (c) Define 'internetworking' and give an outline of the architecture of the internet. (10 marks)