

DUBLIN INSTITUTE OF TECHNOLOGY
KEVIN STREET, DUBLIN 8.

BSc. (Honours) Degree in Computer Science

Year 1

SEMESTER 1 EXAMINATIONS 2012/2013

COMPUTER ARCHITECTURE AND TECHNOLOGY

Art Sloan
Dr. D. Lillis

Tuesday 8th 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) What are the principles of von Neumann Architecture and what are the functional sub-components of that architecture?
(10 marks)
- (b) Describe an example of the structure of a computer's operating system.
(10 marks)
- (c) Describe the main features of the *system bus* of the personal computer architecture.
(10 marks)
- (d) Outline the sequence of a microprocessor's 'Fetch-Execute Cycle' and describe the features of 'multitasking', 'timesharing' and 'threading' briefly.
(10 marks)
2. (a) What was Charles Babbage's contribution to the development of the computer?
(10 marks)
- (b) List the four generations of hardware with a description of the technology associated with each.
(10 marks)
- (c) Describe two examples of a computer's *input devices* and two examples of *output devices*.
(10 marks)
3. (a) What are the binary layouts and labels of the number bases of 2 (binary), 8 (octal) and 16 (hexadecimal) for representing decimal numbers?
(10 marks)
- (b) Define the working principle of each of the three fundamental types of logic gates.
(10 marks)
- (c) How might you specify the measurement of a Central Processing Unit's clock speed?
(10 marks)
4. (a) Describe the 'client-server model' of a computer network.
(10 marks)
- (b) Give examples of the 'cabling' types of network transmission media.
(10 marks)
- (c) List three classes of software virus and describe how a virus might spread on the Internet.
(10 marks)