DUBLIN INSTITUTE OF TECHNOLOGY

DT228 BSc. (Honours) Degree in Computer Science

Year 1

DT282 BSc. (Honours) Degree in Computer Science (International)

Year 1

SUMMER EXAMINATIONS 2014/2015

COMPUTER ARCHITECTURE AND TECHNOLOGY [CMPU1006]

DR. ART SLOAN
DR. DEIRDRE LILLIS

FRIDAY 22ND MAY 9.30 A.M. – 11.30 A.M.

TWO HOURS

ANSWER **QUESTION (1)** AND **ANY TWO** OTHER QUESTIONS.

QUESTION (1), CARRIES **40** MARKS.

QUESTIONS (2), (3), AND (4) CARRY **30** MARKS EACH.

1.

Compulsory

(a) In the context of computer architecture, describe the 'stored program concept'. What are the four subcomponents associated with von Neumann architecture?

(10 marks)

(b) Describe the microprocessor features of the Arithmetic Logic Unit (ALU) and Control Unit.

(10 marks)

(c) Outline some of the aspects of a system bus – such as those found in a personal computer (PC).

(10 marks)

(d) What are expansion slots and what are some of the devices that might be associated with them?

(10 marks)

2. (a) Describe electricity and circuits in relation to their use in computers.

(10 marks)

(b) Compare Base 10 numbers to Base 2 numbers and describe the principles of the binary number system.

(10 marks)

(c) What are the three fundamental types of logic gates, and what is their purpose?

(10 marks)

3. (a) Compare the data-transfer features of parallel and serial buses.

(10 marks)

(b) Describe the main architectural features of the 'northbridge' and 'southbridge' of a chipset.

(10 marks)

(c) List some of the advantages of the 'Hypertransport' motherboard bussing architecture.

(10 marks)

4. (a) How do nodes on a network exchange data? Your answer should include 'linking types' and hardware types for network transmission options.

(10 marks)

(b) Define the term 'network protocol' and describe what is included in a protocol.

(10 marks)

(c) Describe the physical aspects of the Internet that make it a Wide Area Network. What software exists for the Internet that allows it to manage files/data transfer and to interface with the user?

(10 marks)