

**OLLSCOIL NA hEIREANN**  
**THE NATIONAL UNIVERSITY OF IRELAND, GALWAY**

**SUMMER EXAMINATIONS 2000**

**SECOND YEAR BA INFORMATION TECHNOLOGY**

***CT221 TECHNOLOGICAL FRAMEWORKS***

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Time allowed: THREE hours

**ANSWER ANY FIVE QUESTIONS**  
**All questions carry equal marks**

1. (a) Show the 8-bit binary representation of the following numbers, using two's complementary arithmetic where necessary:  
19 ; 37 ; 127 ; 64 ; -64 ; [10]
- (b) Explain the operation of a flip-flop and give an example of its use in computer circuitry. [10]
2. (a) Explain the meaning of the following terms in computer architecture:  
encoder ; data bus ; compiler ; RAM [8]
- (b) Outline the factors which you believe dictated the rise and acceptance of the PC in modern business environments. [12]
3. (a) Choose one computer input device and one output device and explain their technical operation. [12]
- (b) Explain the importance and function of the clock to computer architecture. [8]
4. Choose one person who has made a significant contribution to the development of computing devices, and describe their work. [20]

5. *In the 19<sup>th</sup> Century there were no televisions, no aeroplanes, no computers and no spacecraft..... there was, however, an internet.* Tom Standage.

Justify Standage's remarks by explaining the development and impact of the telegraph on Victorian society, drawing comparison with late 20<sup>th</sup> century technologies and our modern interpretation of the term *Internet*.

[20]

6. (a) Outline some of the problems facing the developer of multimedia material. [12]

- (b) Explain the operation of a token ring communications network, illustrating your answer with a small example. [8]

7. (a) Choose *three* of the following terms and explain their use in data communications:

bandwidth ; modulation ; CSMA/CD ; token passing [6]

- (b) "The Internet is for everyone". Discuss this statement with reference to the issue of equality of access. [14]

8. (a) Explain what is meant by the term TCP/IP. Illustrate your answer using a small example. [12]

- (b) Explain the role and function of the data, address and control buses when a computer is adding two numbers. [8]