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THE NATIONAL UNIVERSITY OF IRELAND

NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATIONS 1999

First University Examination in Arts

INFORMATION TECHNOLOGY (CT100)

Second Paper

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Time Allowed: 3 Hours

Answer five (5) questions in total.
All questions carry equal marks.

- Q1**
- (a) What is an Operating System? Use a diagram to illustrate your answer. List some examples of popular operating systems.
 - (b) What is a User Interface? Distinguish between a console-based user interface and a GUI.
 - (c) What are the main functions of an operating system?
 - (d) What is the difference between a program and a process?
- Q2**
- (a) What is the purpose of a computer's input and output devices?
 - (b) Briefly describe magnetic media, and give at least one example.
 - (c) Briefly describe optical media, and give at least one example.
 - (d) Explain how a screen's resolution is measured, and how screen resolution affects image quality.
 - (e) Briefly discuss how human interaction with a computer has become friendlier from the invention of the computer to the present day.

- Q3**
- (a) Distinguish among bits, bytes, and words.
 - (b) In terms of computer memory, distinguish between RAM and ROM.
 - (c) What is meant by **volatile** memory? Give an example.
 - (d) Explain how cache memory works. Why is it important?
 - (e) Convert the binary number 1101 1100 1001 0010 to decimal.
 - (f) Convert the decimal number 147 to binary.
- Q4**
- (a) Explain why secondary storage is necessary.
 - (b) Define the following terms:
 - Track
 - Sector
 - Disk Address
 - Format
 - (c) Explain how data is accessed on a multi-surface disk. Use a diagram to illustrate your answer.
 - (d) Explain the difference between a logical partition and a physical partition.
 - (e) Explain the relationship between the following terms:
 - Seek time
 - Rotational delay
 - Data transfer time
 - Latency
- Q5**
- (a) What is a network?
 - (b) Briefly explain the history and development of the Internet.
 - (c) Briefly explain the following:
 - protocol
 - HTTP
 - HTML
 - ftp
 - Search Engine
 - Web Browser
 - URL
 - ISP
 - TCP/IP
 - (d) Show, by means of example, how an internet address (**not** a URL) is constructed.

Q6 (a) Explain the relationship between the following terms:

field

record

file

(b) What is a database?

(c) What is a DBMS? Use a diagram to show how a DBMS manages the interaction between users and the database.

(d) Briefly discuss the history of the relational database model.

Q7 (a) Distinguish between system software and application software, giving some examples of each.

(b) Compare packaged software and custom (or tailored) software. Your answer should include a brief description of each, together with their comparative advantages and disadvantages.

(c) Describe the **input/process/output** cycle. Use a diagram to illustrate your answer. Your answer should show the roles of the processor, memory, and secondary storage.

Q8 (a) Why is computer security important?

(b) Explain encryption and decryption. Use a diagram to illustrate your answer. What is a public key?

(c) Explain the following:

PGP

RSA

DES

The Clipper Chip

(d) Distinguish between **substitution ciphers** and **transposition ciphers**.

(e) Describe the **Simple-XOR algorithm**. Explain where it is used and why it should not be used.