

Programme Code: TU856, TU858

Module Code: CMPU1006

TECHNOLOGICAL UNIVERSITY DUBLIN

Grangegorman

TU856 – BSc. (Honours) in Computer Science

**TU858 – BSc. (Honours) in Computer Science
(International)**

Year 1

SEMESTER 2 EXAMINATIONS 2022/23

CMPU1006 Computer Architecture and Technology

Internal Examiners:

Dr. Art Sloan

Dr. Paul Doyle

Instructions To Candidates:

**Answer QUESTION 1 and ANY TWO questions of the remaining
three available.**

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

Exam Duration: Two Hours

1.

NOTE: This question is compulsory

- (a) What are the principles of von Neumann Architecture and what are the functional sub-components of that architecture?
(10 marks)
- (b) Discuss how the Fetch-Execute Cycle manages instructions and data in a computer. The discussion should include an outline of the involvement of the Arithmetic and Logic Unit (ALU) and the Program Control Unit (PCU).
(10 marks)
- (c) Describe the functional principles of logic gates as 'internal' switching devices.
(10 marks)
- (d) Compare the main purposes of latches and flip-flops in data storage and instruction execution.
(10 marks)

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

(10 marks)

- (b) In your own words, describe the importance of Metal Oxide Semiconductor Field Effect Transistors (FETs), to digital computer architecture.
(10 marks)
- (c) Briefly describe how electrical voltage can be related to binary numbers. What are the characteristics of a 'byte'?
(10 marks)

3. (a) What is the history and what are the main features of the system bus, which is an important component of the architecture of a personal computer (PC)?

(10 marks)

- (b) There are several external interface types associated with personal computers (PCs). Discuss these transmission media with examples. You may include historic or obsolete interface types as well as modern types.
(10 marks)
- (c) Network transmission media include cable types and wireless types. Expand on these transmission media with examples.
(10 marks)

4. (a) What are three types of system software of a personal computer (PC), and what is the purpose of system software compared to software applications?

(10 marks)

- (b) How would you describe a database? Name four types of structures that a database can be based upon, and briefly say how Database Management Systems (DBMSs) work as software applications.
(10 marks)
- (c) List some examples of educational course management software and outline the aspects of this software that make it useful to educators and students alike.
(10 marks)