



LOCATION BIRMINGHAM

LLEOLIAD BIRMINGHAM

LEVEL 4

LEFEL 4

**EXAMINATION PERIOD
SEPTEMBER 2023**

**CYFNOD ARHOLIADAU
MEDI 2023**

**MODULE CODE: ACCA4022
COMPUTER ARCHITECTURE**

TIME: 2 HOURS

TOTAL: 100 MARKS

ANSWER ALL QUESTIONS

Equipment or materials required – None

The Candidates are not permitted to bring dictionaries; text books/case studies or any other reference materials into the exam room.

The Candidates are only permitted to use calculators.

Show all your calculations in your exam book

ANSWER ALL FOUR QUESTIONS

QUESTION ONE

(Total: 30 marks)

Attempt all of the following. Electronic Calculators are not permitted. *Write down and show all your manual calculations in your exam book.*

- i. Convert the following numbers to Binary (Base 2).
 - a. $(769)_{10}$ (4 marks)
 - b. $(9A2)_{16}$ (4 marks)
- ii. Convert the following numbers to Octal (Base 8).
 - a. $(87)_{10}$ (3 marks)
 - b. $(5D9)_{16}$ (3 marks)
- iii. Convert the following numbers to Decimal (Base 10)
 - a. $(1110101001)_2$ (5 marks)
 - b. $(50E)_{16}$ (3 marks)
- iv. Convert the following number to Hexadecimal (Base 16)
 - a. $(4278)_{10}$ (4 marks)
 - b. $(670)_8$ (4 marks)

QUESTION TWO

(Total: 5 marks)

Categorise the following hardware based on its usage into the following categories:

- (a) CPU (b) Memory (c) Input device (d) Output device (e) Storage Device (f) Communication device

1. RAM
2. Ethernet Port
3. Microphone
4. Flash Drive
5. Gamepad

QUESTION THREE

(Total: 5 marks)

Determine the time required to complete 50000 instructions by a dual core CPU (Perform two instructions per clock cycle) with a clock frequency of 2.5 GHz.

QUESTION FOUR

(Total: 20 marks)

Construct a logical circuit from the given logical expression and construct a truth table. Use only the basic logic gates (NOT, AND, OR)

$$X = \overline{AB} + CD + BC\overline{D}$$

QUESTION FIVE

(Total: 20 marks)

- a. State two characteristics and two benefits of RAID. (5 Marks)
- b. Describe RAID 1 with suitable diagram. (10 Marks)
- c. Write one advantage and one disadvantage of RAID 1. (5 Marks)

QUESTION SIX

(Total: 10 marks)

Describe the CPU operation functions using Fetch-Execute Cycle.

- a. Draw the Fetch-Execute Cycle (5 Marks)
- b. Briefly describe each step (5 Marks)

QUESTION SEVEN

(Total: 10 marks)

- a. Draw the diagram of Von Neumann architecture. (6 marks)
- b. Write 2 advantages of Von Neumann architecture. (2 marks)
- c. Write 2 disadvantages of Von Neumann architecture. (2 marks)

