

MOUNTAINS OF THE MOON UNIVERSITY
FACULTY OF SCIENCE, TECHNOLOGY AND INNOVATION
DEPARTMENT OF COMPUTER SCIENCE
COURSE WORK

COURSE NAME: COMPUTER ORGANISATION AND ARCHITECTURE

COURSE CODE: BCS 1204

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QUESTIONS;

- 1a). What is computer architecture
- b). Discuss any five importance's of learning about computer architecture
- 2a). Differentiate between RISC and CISC
- b). Advantages and disadvantages of each and where they are applied
- 3a). Differentiate between uni-programming and multi-programming
- b). Discuss how uni-programming and multi-programming is implemented by a computer

Answers

1a)

Computer architecture refers to a set of rules and methods that describe the functionality, management and implementation of computers.

b)

The importances of learning computer architecture are as follows;

- ✓ It helps in creating career opportunities such as computer architecture design and system administration which improves people's standards of living
- ✓ Provides performance optimization in software and hardware since it helps one to design algorithms that improve efficiency and effectiveness
- ✓ It helps in decision making since it helps architects to make selection and integration of hardware and software components to meet specific requirements
- ✓ It helps in troubleshoot computer systems that have issues like system failure
- ✓ It helps the user to know how different components interact and can identify potential bottlenecks or compatibility issues

2a)

Reduced Instruction Set Computer (RISC) refers to the use of small and simple set of instructions to perform operations. RISC processors are found in embedded systems. its processors have a simplified instruction set that faster execution of instructions.

While

Complex Instruction Set Computer (CISC) refers to architectures that uses large and diverse set of instructions to perform operations. It aims at providing functionality and flexibility to instructions

b)

RISC

ADVANTAGES	DISADVANTAGES
➤ Simpler instructions: This makes processing faster since RISC uses smaller and simple instructions making it easier to decide and execute questions	➤ Programs may require more instructions to complete tasks than with CISC

➤ Lower power consumption: This makes them more ideal for portable devices and embedded systems	➤ Limited ability to perform complex instructions
➤ Efficiency: They can execute instructions in fewer clock cycles resulting to improved performance and energy efficiency	
➤ Smaller chip size which can save some costs	
➤ Uses Pipe-lining which increases performance since a command is executed one after the other	

CISC

ADVANTAGES	DISADVANTAGES
➤ Ability to perform complex instructions	➤ Increased complexity can slow down the processing at times
➤ Programs require fewer instructions to execute commands	➤ Large chip size can lead to high power consumption since large chips contain more transistors
➤ Uses greater hardware that support the performance of complex instructions	➤ High costs since processors are more complex to manufacture due to complex architecture

3a)

Uni-programming is a type of programming that uses only one thread or task MS and Apple MAC at a time e.g. Apple Mac

while

Multi-programming is a type of programming that uses more than one thread at a time.

b) Below are the ways how uni programming is implemented

- Sequential execution: this ensures that tasks are written in sch a way that they don't rely on parallel execution thus avoiding multi programming
- Blocking Operations: These can pause the execution of any program. Therefore, uni programming ensures that operations are designed not to block the execution of others tasks.
- Even-Driven Programming: This refers to an approach where the flow of data is determined by events such as actions. Uni programming helps to respond to events such as user interactions and network requests sequentially through a thread.

- **Concurrency Control:** this helps in dealing with multiple tasks simultaneously. This is used by developers to prevent race conditions and ensure that integrity when multiple processes access shared resources.

Multiprogramming is implemented by dividing memory into partitions where memory programs are loaded concurrently. The operating system keeps things organized in the background so that multiple programs can run at the same time. This gives the program its own memory so that each accesses its own resources.

References:

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