**Introduction to Communication and information and information Technologies**

**Assignment #1**



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**Question #1**

1. **(110101101)2 = ( ? )8**

Solution:

From Binary to Octal Number system

1. 1 1101)2 = (655)8

**c :(7564)8 = ( ? )2**

Solution:

From Octal to Binary Number system:

(7564)8 = (111 101 110 100)2

1. **(110101101)2 = ( ? ) 10**

Solution:

(110 101 101)2 = (429)10

**d:**

**(7564)8 = ( ? )10**

**Solution:  
(7564) 8 = (3956)10**

**e.   9675 = ( ? )2**

**Solutions:**

**(9675)16 = (1001 0110 0111 0101)2**

**f : (9675) = ( ? )8**

**Solutions:**

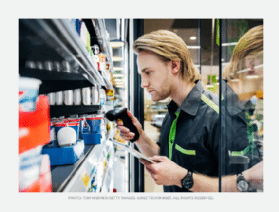
**(9675)16 = (113165)8**

**Q 2:**  
**What are barcode readers?**

**Answer:**

A barcode reader, also called a price scanner or point-of-sale (POS) scanner, is a hand-held or stationary input device used to capture and read information contained in a barcode.

A barcode reader comprises a scanner, a decoder (either built-in or external), and a cable used to connect the reader with the computer or POS system.



**Explain briefly components of CPU?**

The central processing unit (CPU) consists of six main components:

* control unit (CU)
* arithmetic logic unit (ALU)
* registers
* cache
* buses
* clock

All components work together to allow processing and system control.

**Control unit**

The CU provides several functions:

* it fetches, decodes and executes instructions
* it issues control signals that control hardware
* it moves data around the system

**Arithmetic logic unit**

The ALU has two main functions:

* It performs arithmetic and logical operations (decisions). The ALU is where calculations are done and where decisions are made.
* It acts as a gateway between primary memory and secondary storage . Data transferred between them passes through the ALU.

**The ALU performs calculations and makes logical decisions.**

**Registers**

Registers are small amounts of high-speed memory contained within the CPU. They are used by the processor to store small amounts of data that are needed during processing, such as:

* the address of the next instruction to be executed
* the current instruction being decoded
* the results of calculations

Different processors have different numbers of registers for different purposes, but most have some, or all, of the following:

* program counter
* memory address register (MAR)
* memory data register (MDR)
* current instruction register (CIR)
* accumulator (ACC)

**Cache**

Cache is a small amount of high-speed random-access memory (RAM) built directly within the processor. It is used to temporarily hold data and instructions that the processor is likely to reuse. This allows for faster processing as the processor does not have to wait for the data and instructions to be fetched from the RAM.

**Buses**

A bus is a high-speed internal connection. Buses are used to send control signals and data between the processor and other components.

Three types of bus are used:

* Address bus - carries memory addresses from the processor to other components such as primary memory and input/output devices.
* Data bus - carries the actual data between the processor and other components.
* Control bus - carries control signals from the processor to other components. The control bus also carries the clock's pulses.

**Clock**

The CPU contains a clock which is used to coordinate all of the computer's components. The clock sends out a regular electrical pulse which synchronises (keeps in time) all the components.

The frequency of the pulses is known as the clock speed. Clock speed is measured in hertz. The higher the frequency, the more instructions can be performed in any given moment of time.

In the 1980s, processors commonly ran at a rate of between 3 megahertz (MHz) to 5 MHz, which is 3 million to 5 million pulses or cycles per second. Today, processors commonly run at a rate of 3 gigahertz (GHz) to 5 GHz, which is 3 billion to 5 billion pulses or cycles per second.