Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2024-25

Class:	SE	Semester:	III
Course Code:	CSC304	Course Name:	DLCA

Name of Student:	SHARVARI ANAND BHONDEKAR
Roll No. :	06
Assignment No.:	01
Title of Assignment:	Convert one number system to another and realize logic circuits using basic/universal gates.
Date of Submission:	06/08/24
Date of Correction:	06/08/24

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Demonstrated knowledge	5	4
Legibility	3	2
Completeness and timely submission	2	2
Total	10	8

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Demonstrated Knowledge	5	3-4	1-2
Legibility	3	2	1
Completeness and Timely submission	2	1	0

Checked by

Name of Faculty : Ms. Rshigtiga Gharat.

Signature : Gharat

Date : 6/8/24

ASSIGNMENT No. 1

(Q1.) $(532.125)_8$

Octal to Decimal Conversion can be done as follows:

$(532.125)_8 = (5\times8^2) + (3\times8^1) + (2\times8^0) + (1\times8^{-1}) + (2\times8^{-2}) + (5\times8^{-3})$

$= 320 + 24 + 2 + 0.125 + 0.03125 + 0.00976$

$\therefore (532.125)_8 = (346.16601)_{10}$

Octal to Binary conversion can be done as follows:

$(532.125)_8 = (101011010.001010101)_2$.

Since we know that

$(5)_8 \rightarrow (101)_2$.
$(3)_8 \rightarrow (011)_2$
$(2)_8 \rightarrow (010)_2$.
$(1)_8 \rightarrow (001)_2$

Octal to Hexadecimal conversion can be done as follows.

we know that

$(532.125)_8 = (101011010.00101\ 0101)_2$.

$(5)_8$.

Also 4 bits in a group are extracted to form hexadecimal number

$(101\ 011010 \cdot 00101010 1)_2 =$
$(0001\ 0101\ 1010 \cdot 0010\ 1010\ 1000)$

$(532 \cdot 125)_8 = (15A \cdot 2A8)_{16}$

Q2.]

→ Gray code is a binary numbering system where two successive values differ by only one bit (binary digit) respectively.

To find gray code of $(29)_{10}$, we first convert it to binary numbers respectively.

2	29	
2	14	1 ← LSB.
2	7	0
2	3	1
2	1	1
	0	1 ← MSB

$\therefore (29)_{10} = (11101)_2$.

Now, binary to gray code,

$(11101)_2 = (10011)$ graycode.

∴ (29)10 = (10011) graycode.

Q 3)

→ The Von Neumann architecture is a computer architecture based on a 1945 description by John Von Neumann and others. The ~~design~~ document describes a design architecture for an electrical digital computer.

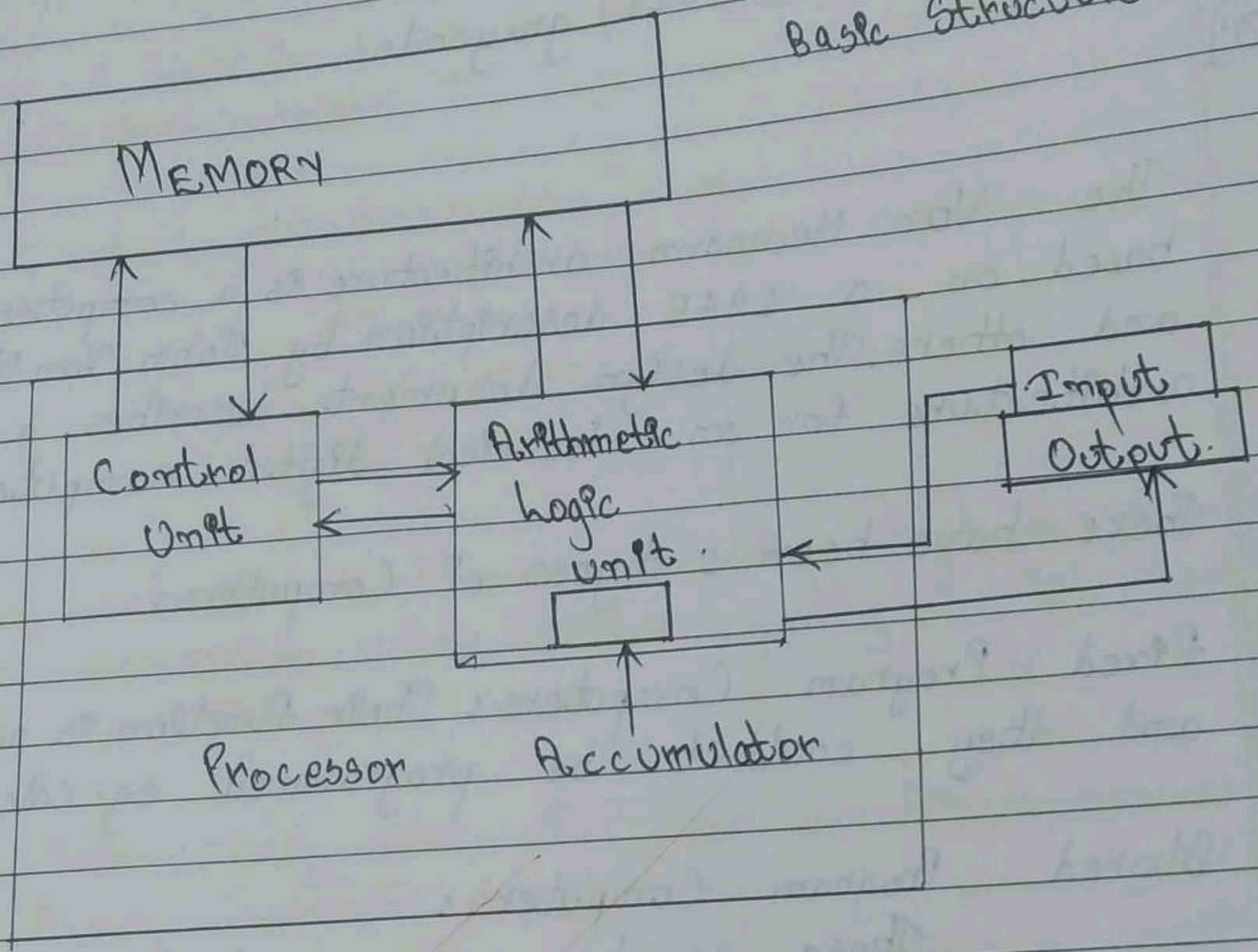
There have been 2 types of Computers:

1. fixed Program Computers: Their function is very specific and they couldn't be programmed eg. calculators.

2. Stored Program Computers:
These can be programmed to carry out many different tasks, applications are stored on them, hence the name.

- The modern computers are based on a stored-program concept introduced by John Von Neumann.
- In this stored-program concept, programs and data are stored in a separate storage unit called memories. This novel idea meant that a computer built with this architecture would be much easier to reprogram.

Von Neumann
Basic Structure.



It is also known as IAS computer and is having three basic units:

1. Central Processing Unit (CPU).
2. The Main Memory unit
3. The Input/Output Device.

1. Central Processing Unit.

a) Control unit: It handles all processor signals. It directs all input and output flow, fetches code for instructions and controls how data moves around the system.

b.) Arithmetic & logic unit (ALU): It is that part of the CPU that handles all the calculations the CPU needs. It performs logical Operations, Bit shifting operations and Arithmetic Operations respectively.

2. Main Memory Unit:

a.) Accumulator: Stores the result of calculations made by ALU.

b.) Program Counter (PC): Keeps track of the memory location of next instructions to be dealt with. The PC then passes this next address to Memory Address Register (MAR) respectively.

c.) Memory Address Register (MAR): It stores memory locations of instructions that need to be fetched from memory or stored into memory.

d.) Memory Data Register (MDR): It stores instructions fetched from memory or any data that is to be transferred to and stored in Memory.

e.) Current Instruction Register (CIR): It stores the most recently fetched instructions while it is waiting to be coded & executed.

3.) Input / Output devices:

- Program or data is read into main memory from the input device under the control of CPU input instruction.
- Output devices are used to display the output or the information from the computer.