VIVEKANANDA COLLEGE
THAKURPUKUR
KOLKATA-700063

NAAC ACCREDITED 'A' GRADE

Topic: Microcontrollers

Course Title: Microprocessor and Microcontrollers

Paper: GE-4

Unit:

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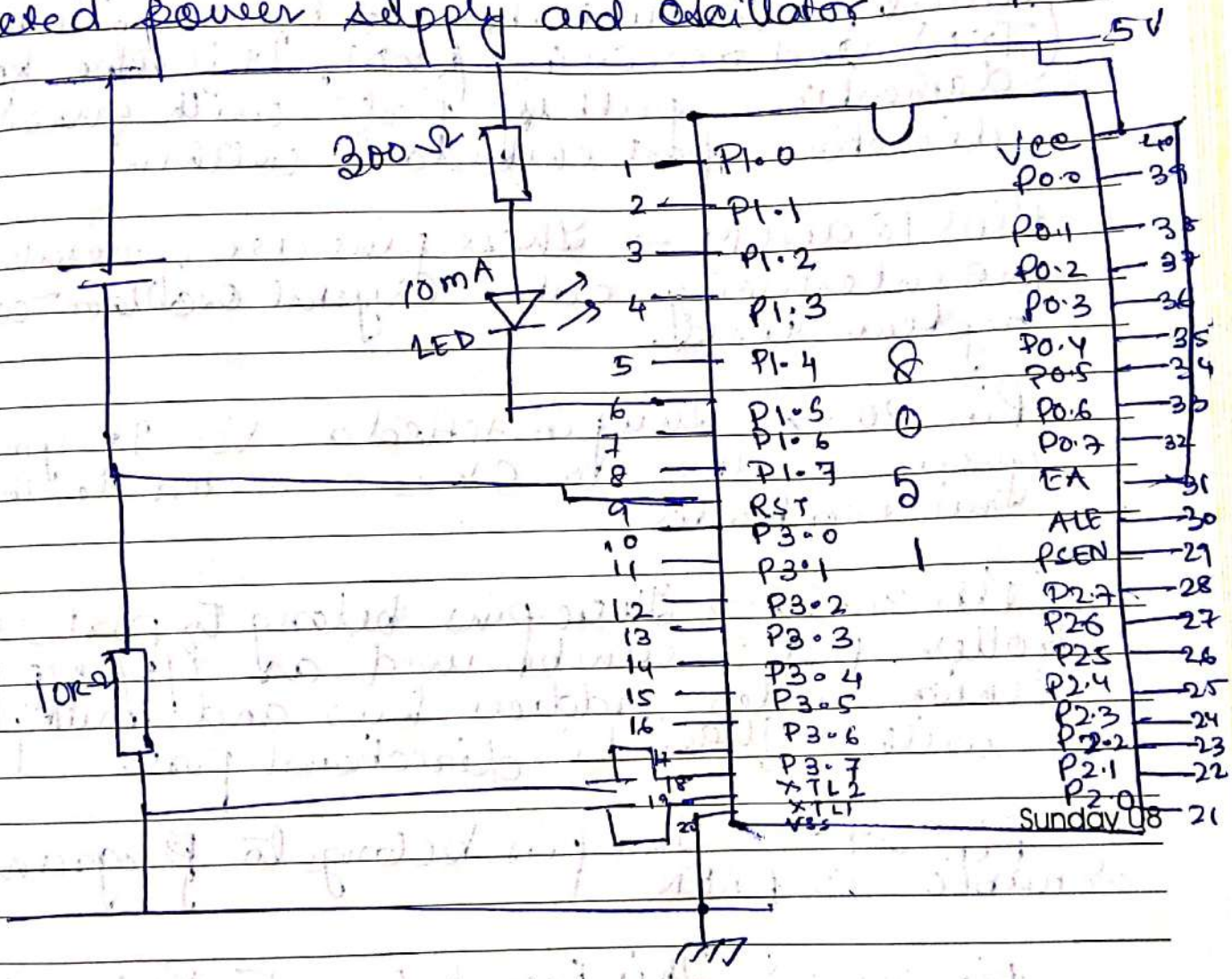
Name of the Department: Electronics

8051 (GE-4)

Microcontroller architecture

Let see the 40 pin Dual Inline Package (DIP) of microcontroller integrated circuit with externally connected power supply and oscillator.



Pin 1-8 → These pins belong to port 1 of µ controller. Port 1 is used as domestically pulled up, quasi bidirectional input/output port.

Pin 9 → It is a RESET pin which is utilised to set the microcontroller 8051 to its primary value. During the beginning of an application

the RESET pin is to set elevated evaluated for two machine rotations.

Ports 10-17 → These pins belong to port 3 of microcontroller. Port 3 can be used for no. of functions such as timer input, interrupts, serial communication indicator for transmitting (TXD) and receiving (RXD). It is also known as domestic pull up port with quasi bi direction port embedded within.

Pins 18 and 19 → These pins are generally be used for interfacing outer crystal oscillator with given system clock.

Pin 20 → This pin titled as Vss. It symbolises ground voltage 0V is connected to this pin of microcontroller.

Pin 21-28 → These pins belong to port 2 of Microcontroller. Port 2 can be used as i/p/ o/p port, senior order address bus and multiplexed with quasi bi directional port.

Pin 29 → The pin belongs to Program Store Enable or PSEN

Pin 30 → This pin belongs to External Access or EA i/p is used for permit or prohibit outer memory interfacing.

Pin 31 → This pin belongs to Address Latch Enable or ALE it is used for demultiplexing the address data indication of port 0 for outer memory interfacing.

Pin 32-39 → These pins belong to port 0 of the microcontroller. Port 0 can be used as input/output port, lower address and data bus signals are multiplexed with this port. This pin act as bidirectional i/p/o/p port.

Pin 40 → This pin provides power supply to the circuit.

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In 8051 microcontroller I/O operations are performed by using four ports and 40 pins. I/O operation port uses 32 pins with each port has 8 pins. The remaining 8 pins are used for providing.

P0, P1, P2 and P3 each port is 8 bit port having 8 pins each. During RESET, all ports are used as i/p ports. When the port gets first 0, then it becomes an o/p port. For reconfigure it as an i/p, the high signal must be sent to a port.

Port 0 (Pin 32 to 39)

Port 0 contains 8 pins. It can be used as input or o/p. In general, we connect P0 with 10k.

Remember

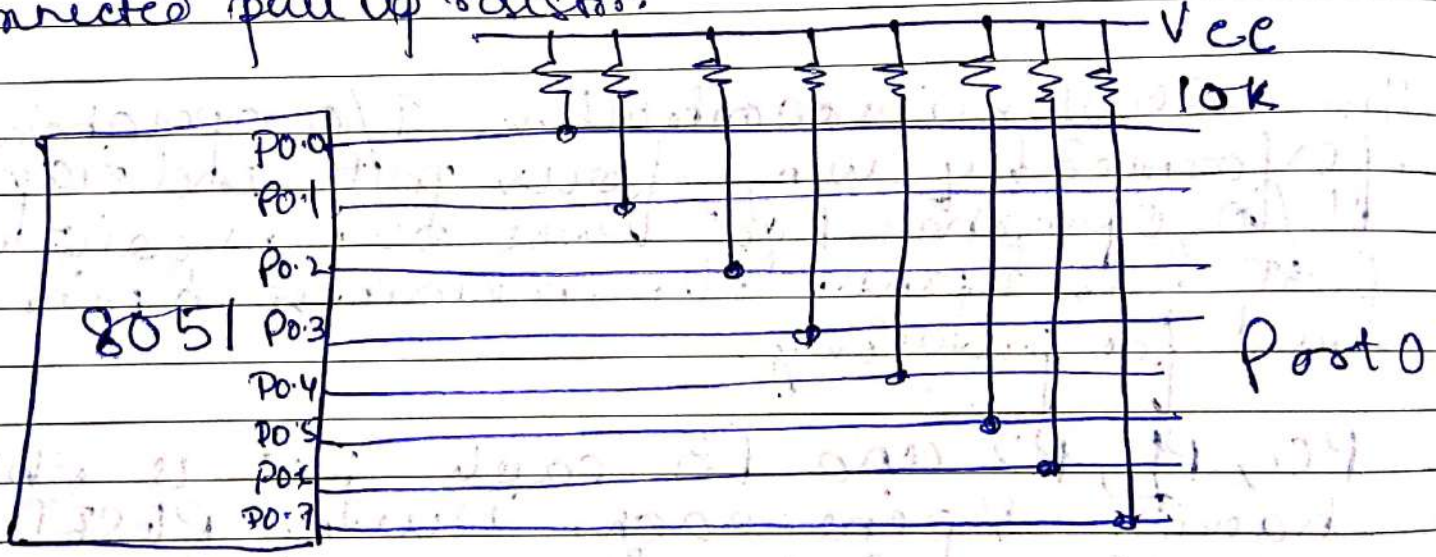
pull up resistors for using it as an ip or op port for being an open drain.

It is also referred as AD0 - AD7 used as both address and data transfer port. When we want to excess the external ROM, then P0 is used as both data & address bus.

Pin 31 (ALE) indicates if P0 is used as address or data

When ALE = 0, then it provides data D0 - D7
When ALE = 1, it provides address A0 - A7

Let see the structure of port 0 with externally connected pull up resistor.



Let see an Assembly language code for making the port 0 to be worked as input.

MOV A, #FFH (FFH = 1111 1111)
MOV P0, A (port 0 all pins have 1's to work as an input)

Port 1 (pin 1-8)

It is also an 8 bit port and can be worked as either i/p or o/p. It does not require external connected pull up resistors because they are already present internally. Upon Reset, port 1 is worked as an i/p.

If port 1 is configured as o/p port, then to make port 1 as i/p port again, we write 1 to all bits of port 1 as below code.

```
MOV A, #FFH
MOV P1, A
MOV A, P1
MOV R5, A
ACALL DELAY
MOV A, P1
MOV R6, A
ACALL DELAY
MOV A, P1
MOV R7, A.
```