GPC Bhilwara

Branch :- Electronics

II nd Mid Term Exam

III year

Paper Code : EL 302

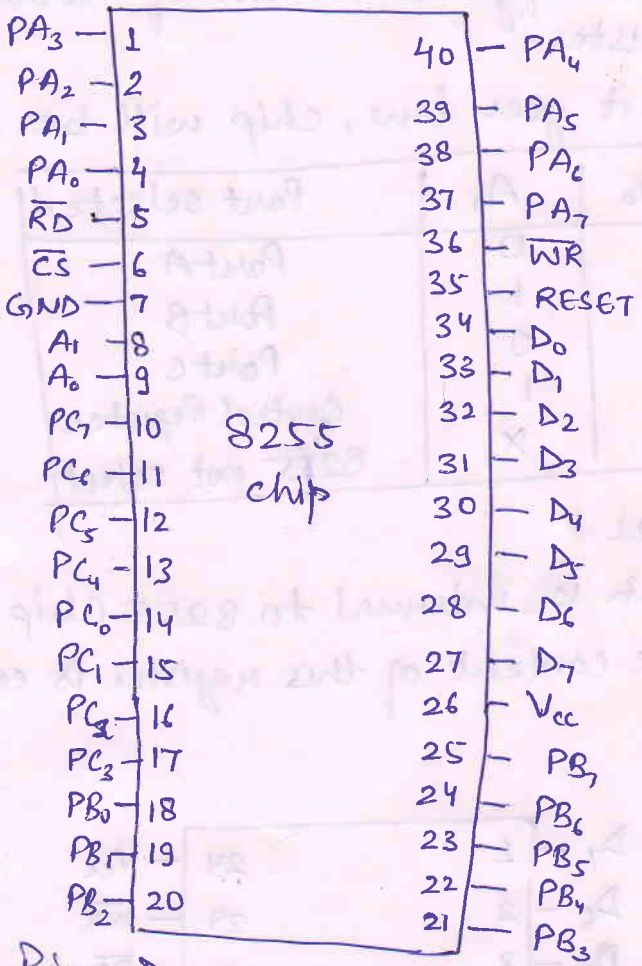
Qns 1 Explain pin configuration of 8255 chip. (5)

Qns 2 Explain pin configuration of 8253 chip. (5)

Qns 3 Write short note on flag status of 8086 microprocessor (5)

Solution of Paper
Code EL 302

Ans 1.



Pin Diagram of 8255

A) Parallel Ports

Port A, Port B and Port C are used as 8-bit parallel port for receiving / sending data.

Port C can be divided into two 4 bit ports : C_{upper} & C_{lower}
It can be also used for handshake signals.

B) Control section

(i) $\overline{RD}$ (Read) : When it goes low, the microprocessor read data from selected I/O port of 8255.

(ii) $\overline{WR}$ (Write) : When it goes low, the microprocessor write data into selected I/O port or control register.

(iii) RESET :- It clear the control register and set all ports in the input mode.

(c) Address logic.

(i) A_0, A_1 : The combination of A_0 and A_1 address line is used to identify the address of various port & control register.

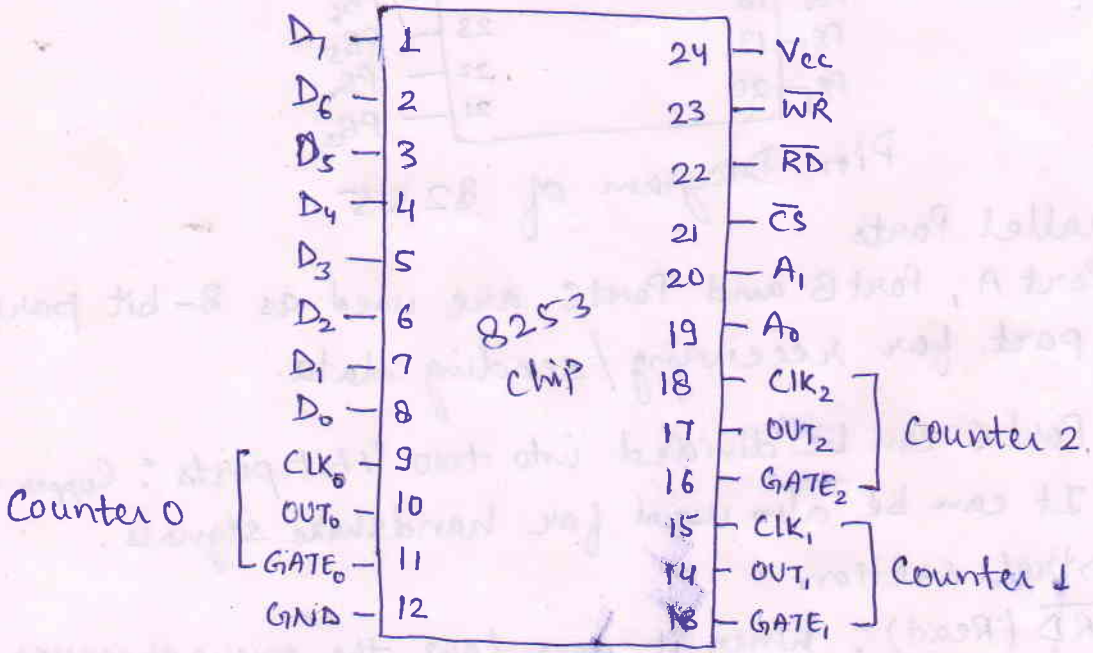
(ii) $\overline{CS}$: When it goes low, chip will be selected.

$\overline{CS}$	A_0	A_1	Port selected
0	0	0	Port A
0	0	1	Port B
0	1	0	Port C
0	1	1	Control Register
1	X	X	8255 not select

(D) Control Register

Register which is internal to 8255 chip is called control register. The content of this register is called control word.

Ans 2.



Pin diagram of 8253 chip

(A) Counters

8253 chip includes three 16-bit counters namely: Counter 0 Counter 1 and counter 2. Each counter has its own 16-bit Counter register to set the ~~con~~ count value for the respective counter.

CLK0, CLK1, CLK2 (Clock Signal): These are input signals for Counter 0, Counter 1 and Counter 2 respectively. To generate delay, contents of the respective counter are decremented on each clock cycle.

GATE0, GATE1, GATE2 (Gate signal): These are input signals for Counter 0, Counter 1 and counter 2 respectively. To start and stop counting of respective counter, GATE signal is used. When GATE signal is high, the counting starts and when it goes low, the counting stop.

Out0, OUT1, OUT2 (Output Signal): These are output signals for counter 0, counter 1 and counter 2 respectively. When its goes high, the content of counter reaches to zero.

(B) Data Bus ~~Buffer~~:

Data Bus ($D_0 - D_7$) is connected to data bus buffer. It is used for sending / receiving data.

(C) Control logic:

(i) $\overline{RD}$ (Read) :- It goes low, microprocessor read the data from various counter.

(ii) $\overline{WR}$ (Write) :- When its goes low, the microprocessor write the data into counter

(iii) A_0, A_1 :- Microprocessor address line A_0 and A_1 are connected to these pins. The combination of these two pins are used to identify various counter & control register.

(iv) $\overline{CS}$: when its goes low, chip will be selected.

$\overline{CS}$	A_0	A_1	Selected Counter
0	0	0	counter 0
0	0	1	Counter 1
0	1	0	Counter 2
0	1	1	Control Register
1	X	X	8253 not selected

Ans 3 Flag Status of 8086 microprocessor.

X	X	X	X	OF	DF	IF	TF	S	Z	X	AC	X	P	X	CF

(i) Carry flag (CF) :- Carry flag serves as carry or borrow status produced by addition or subtraction operation

(ii) Parity flag (P) :- P=1 when no. of 1's in result is even
P=0 when no. of 1's in result is odd.

(iii) Auxillary Carry (AC) :- AC=1 when carry from D_3 bit to B_4 bit.
else AC=0

(iv) Zero flag (Z) :- Z=1 when result of operation is zero
else Z=0

(v) Sign flag (S) :- S=1 when D_7 bit is 1 in result of operation
S=0 when D_7 bit is 0 in result of operation.

(vi) Overflow flag (OF) :- It is used for signed operation.
OF=1 when result is out of range

(vii) Trap flag (TF) :- It is used to interrupt the program execution after each step, when set. The Trap flag is used for single step execution of program

(viii) Interrupt flag :- By setting & resetting the interrupt flag, the interrupt can be enabled & disabled respectively.

(ix) Direction Flag :- It is used with string operations.
If direction flag is set, the string processed from the high address towards low address.
If direction flag is reset, the string processed from the low address towards high address.